EDISON
ELECTRIC INSTITUTE
BULLETIN

GEOGRAPHY, RESOURCES & INDUSTRIES
LIPPINCOTT LIBR

AUGUST, 1941

AUG 28 1941

Late Developments in Load and Capacity . . . . . H. S. BENNION 329

Easing Your Priority Problems with Reclamation . . . K. C. CAMPBELL 331

Plain Talk on Public Relations . . . . . KIMBALL JACK 337

Partnership of Utility and Retailer . . . . . C. E. GREENWOOD 342

Combustion Analysis in the Modern Boiler Unit . . . . . H. B. LAMMERS and E. B. WOODRUFF 343

Better Light-Better Sight Bureau Offers New Program 350

"If Mammy Trots and Daddy Trots the Colt Won't Pace" . JESS PASCHALL 351

Tree Clearance for Overhead Electric Lines—Preliminary Suggestions . . . . . G. D. BLAIR 353

Personnel of E.E.I. Committees for 1941-1942 355

Commercial Electric Cooking Council Prepares Sales Training Manual . . 361

Power Sales Manual Proves Helpful Both for Training and in Selling . . 362

Personals 363

Conventions and Meetings, 364

EDISON ELECTRIC INSTITUTE

THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

May, 1941

SOURCE AND DISPOSAL OF ENERGY—MONTH OF MAY

	1941	1940	%
GENERATION* (net)			
By Fuel Burning Plants	9,363,578,000	7,010,717,000	+33.6
By Water Power Plants	4,243,309,000	4,603,651,000	− 7.8
Total Generation	**13,606,887,000**	**11,614,368,000**	**+17.2**
Add—Net Imports Over International Boundaries	78,332,000	82,256,000	− 4.8
Less—Company Use	150,251,000	139,985,000	+ 7.3
Less—Energy Used by Producer	316,335,000	438,096,000	−27.8
Net Energy for Distribution	**13,218,633,000**	**11,118,543,000**	**+18.9**
Losses and Unaccounted for	2,138,210,000	1,751,400,000	+22.1
Sales to Ultimate Customers	**11,080,423,000**	**9,367,143,000**	**+18.3**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of May 31st			
Residential or Domestic	25,322,121	24,326,778	+ 4.1
Rural (Distinct Rural Rates)	939,899	660,714	.....
Commercial or Industrial:			
Small Light and Power	4,268,143	4,219,031	+ 0.9
Large Light and Power	171,437	179,662	
Other Customers	117,771	113,292	.....
Total Ultimate Customers	**30,819,371**	**29,499,477**	**+ 4.5**
KILOWATTHOUR SALES—During Month of May			
Residential or Domestic	1,903,530,000	1,787,015,000	+ 6.5
Rural (Distinct Rural Rates)	148,014,000	152,367,000	− 2.9
Commercial or Industrial:			
Small Light and Power	1,913,743,000	1,742,140,000	+ 9.9
Large Light and Power	6,194,062,000	4,796,668,000	+29.1
Street and Highway Lighting	146,183,000	142,786,000	+ 2.4
Other Public Authorities	243,044,000	215,246,000	+12.9
Railways and Railroads:			
Street and Interurban Railways	313,506,000	315,003,000	− 0.5
Electrified Steam Railroads	168,178,000	152,603,000	+10.2
Interdepartmental	50,163,000	63,315,000	−20.8
Total to Ultimate Customers	**11,080,423,000**	**9,367,143,000**	**+18.3**
Revenue from Ultimate Customers	**$209,706,500**	**$193,280,200**	**+ 8.5**

RESIDENTIAL OR DOMESTIC SERVICE (Revised Series)

AVERAGE CUSTOMER DATA—For the 12 Months Ended May 31st			
Kilowatthours per Customer	967	921	+ 5.0
Average Annual Bill	$36.65	$36.10	+ 1.5
Revenue per Kilowatthour	3.79¢	3.92¢	− 3.3

* By courtesy of the Federal Power Commission

Vol. 9, No. 8, EDISON ELECTRIC INSTITUTE BULLETIN; published monthly. Entered as second-class matter Aug. 17, 1933, at the post office at Philadelphia, Pa., under the act of March 3, 1879. Publication office, 56th and Chestnut Sts., Philadelphia, Pa. Editorial office, 420 Lexington Ave., New York, N. Y. Subscription rate $2.00 per year in the United States; $3.00 per year in foreign countries.

The Edison Electric Institute does not assume responsibility for, nor necessarily endorse or approve, statements made by contributors to the BULLETIN.

EDISON ELECTRIC INSTITUTE BULLETIN

Volume 9 AUGUST, 1941 No. 8

Late Developments In Load and Capacity

Overall Picture Reveals Comfortable Margins of Reserve

By H. S. Bennion

Vice-President and Managing Director, Edison Electric Institute

MONTHLY peak load data has now been collected by the Institute covering a period of two years. Reports are received from utility enterprises, private and public, representing 86 per cent of the generating capacity contributing to the public supply of power in the United States.

The sum of non-coincident peak loads for the reporting companies increased in the two-year period from June, 1939, to June, 1941, approximately 6,000,000 kw. About 2,300,000 of this growth occurred in the first year and 3,650,000 in the second year. Generating capacity in the two year period increased about 3,000,000 kw. Extending the figures of the reporting utilities to 100 per cent of the total electric light and power industry on the assumption that the reporting enterprises constitute an accurate sample of the entire business, the month-to-month record of peak loads since June, 1939, is shown in Table 1.

Although the growth of peak demands has been unusually large, it is not startling and the overall picture reveals comfortable margins of reserve. This monthly peak demand is affected, of course, to a considerable extent by weather conditions—an unusually dark, stormy day affecting a widespread area; in the summer, an unusually hot day; and in the winter, an unusual cold spell.

Regional figures on capacity and peak load for June are shown in Table 2, while Table 3 shows by regions how the peak load, month by month, has increased in comparison with the corresponding peak load figure for the previous year. This helps to give a visual picture of how production has been speeding up in this country. Pronouncements of government officials concerned with munitions production have indicated that production will reach high levels by the end of this year. As late as August 13, Mr. W. S. Knudsen remarked that production under the present rearmament and lease-lend programs should reach its peak by midsummer of 1942.

Table 2, in addition to giving capacity and peak load figures, shows the relation between percentage increase in peak load and percentage increase in weekly output of electricity. These figures indicate that the factories in New England, Middle Atlantic and Central industrial areas are working substantially longer hours per week than they were at the beginning of this year.

TABLE 1—CAPACITY AND PEAK LOADS OF ELECTRIC LIGHT AND POWER INDUSTRY
Total—U. S. A.

Month	*Generating Capacity (kw)*	*Sum of Peak Loads (kw)*
1939		
June	39,600,000	24,700,000
July	39,725,000	25,000,000
August	39,850,000	25,400,000
September	40,200,000	26,750,000
October	40,250,000	27,400,000
November	40,300,000	28,450,000
December	40,318,000	29,300,000
1940		
January	40,350,000	28,250,000
February	40,400,000	27,050,000
March	40,450,000	26,600,000
April	40,550,000	26,325,000
May	40,650,000	26,500,000
June	40,650,000	27,000,000
July	40,925,000	27,500,000
August	41,056,000	27,900,000
September	41,132,000	28,700,000
October	41,286,000	29,750,000
November	41,449,000	31,000,000
December	41,639,000	31,500,000
1941		
January	41,698,000	30,800,000
February	41,773,000	29,900,000
March	41,912,000	29,700,000
April	42,041,000	29,300,000
May	42,222,000	29,900,000
June	42,436,000	30,650,000
July*	42,750,000	31,250,000
December*	45,000,000	35,000,000

Notes:
Generating Capacity and Output: As reported each month by the Federal Power Commission for all plants contributing to the public supply.
Sum of Peak Loads: Total non-coincident peaks reported by the Edison Electric Institute, raised to 100 per cent of the electric light and power production by the plants whose generating capacity is shown in the preceding column.
* Preliminary estimate.

New construction by the entire industry will add about 3,500,000 kw in 1941. Isolated industrial plants will add another 1,000,000 kw in 1941. In 1942, 3,227,000 kw are to be added. Already 3,028,000 kw are scheduled for installation in 1943 and the supplementary TVA program would raise this to 3,778,000 kw.

Table 4 shows how the new installations are divided among the electric utilities, municipal utilities and Federal projects.

Estimates indicate that the total installed capacity by the end of 1941 will be about 45,000,000 kw to carry a peak load which should reach about 35,000,000 kw for this year. If the peak of the nation's industrial effort is reached in midsummer of 1942, the figures in the tables herewith presented indicate that provision has been made to meet the general needs of the situation by a good margin. If the munitions programs are expanded, the new capacity scheduled for installation in 1942 and that already scheduled for 1943 should surely keep up with such further expansion, considering the limitations in raw materials, labor and other factors which must hold down and retard such expansions. Shortages of materials and the influence of priorities on non-defense construction, business and production may prove a material damper on further growth of power load so long as the rearmament

program remains at top speed. This is generally expected by business forecasting agencies. Already this year there has been a little slowing down in the growth of residential and retail commercial sales. Residential sales, which increased 10.6 per cent last year, increased 8.1 per cent the first six months of this year. Retail commercial sales, which increased 8 per cent last year, increased 6.8 per cent the first six months of this year. By contrast, the increase in industrial sales have risen from 16.5 per cent to 24.5 per cent for the same periods.

Our total 1941 output of electricity by both central station and isolated generating plants is expected to reach 200 billion kwhr—165 billion by central stations and 35 billion by isolated generating plants.

The overall figures presented in the accompanying tables reflect only the general situation in this country. They show that generally speaking there will be an adequate supply of power in the large power consuming areas to meet the peak of our armament effort due next year. They do not guarantee against shortages of some weeks duration in water power areas if these should happen to be visited by extreme drought such as occurred in the Southeast this year, nor do they insure against some local shortages, particularly if in a certain area Uncle Sam places a munitions plant requiring power far in excess of what that region has previously been called upon to supply.

In recent months this question of the adequacy or lack of adequacy of the nation's power supply has been somewhat confused in the public mind as a result of extraordinary increases in the government program for aluminum and magnesium production, two metals which require large amounts of electricity for their manufacture as compared with requirements for electricity for other types of manufacture. Additional plants for manufacturing these two metals, undoubtedly for very good reasons, have not been located by the government near the great commercial centers where large existing reserves of power, at least during nine or ten months of the year, might be drawn upon. The new plants have been located in areas where the existing demands for power were not large relatively and in most cases such existing supplies had already been preempted to a considerable extent by other munitions plants and by the creation of Army camps. The TVA, Bonneville and Grand Coulee, large government hydro projects, partly completed or nearing completion, naturally were selected to supply much of the power for the manufacture of these two metals. This sudden demand for a time upsets the plans of private companies in those regions because they had previously counted upon these same power sources to supply their growth of load and for several years past had ceased building new plants with a view to absorbing a part of the output of these large projects.

The problem of power supply presented in the Southeast this year undoubtedly has tended to obscure the fact that the preponderant part of American homes, business and industry have been provided with a dependable and ample power supply to meet all power requirements that have yet arisen and that construction has been planned and is being carried out which should reasonably assure an adequate supply indefinitely ahead. It is true that margins of reserve are not quite as wide as they were two years ago but this is reasonably to be expected in an emergency period. Three years ago and again two years ago the industry added generating capacity at the request of government agencies to increase margins of reserves for the very situation we now find ourselves in. Nevertheless the margins at the end of this year will not be much less than they were a year ago and appear to be ample to safeguard the supply of power to all classes of customers except for the possible situations previously noted.

TABLE 2—CAPACITY AND PEAK LOAD, MONTH OF JUNE
As Reported by some 250 Principal Utility Enterprises

	Capacity as of June 30, 1941	*Peak Loads 1941*	*1940*	*1939*	*Peak 1941 1940* %	*Kwhr Output 1941 1940* %
United States	36,628,871	26,448,530	23,305,796	21,394,167	+13.5	+16.1
New England	2,730,163	1,888,212	1,643,066	1,556,930	+14.9	+23.3
Middle Atlantic	7,859,056	5,422,718	4,807,068	4,422,225	+12.8	+16.7
Central Industrial	11,704,724	8,928,148	7,746,712	6,855,463	+15.3	+21.5
West Central	2,081,737	1,283,837	1,165,442	1,119,942	+10.2	+13.6
Southern	6,490,023	4,707,337	4,176,756	3,793,900	+12.7	+15.7
Rocky Mountain	1,355,140	1,084,733	953,877	871,182	+13.7	+ 9.9
Pacific	4,408,028	3,133,545	2,812,875	2,774,525	+11.4	+ 3.7

TABLE 3—PERCENTAGE CHANGE IN COMPOSITE PEAK LOAD OF 250 REPORTING UTILITY ENTERPRISES
Increase, each month, over corresponding month of previous year

Month	*Economic Region*							
	New England	*Middle Atlantic*	*Central Industrial*	*West Central*	*Southern*	*Rocky M'tn.*	*Pacific*	*Total U.S.A.*
1940								
June	6.6	8.4	13.3	5.5	10.5	9.4	2.6	9.3
July	3.5	7.9	14.7	7.3	10,0	6.8	6.4	9.8
August	7.3	6.7	11.5	6.6	15.0	8.7	7.1	9.9
September	2.9	5.7	10.0	4.5	7.3	0.5	8.6	7.2
October	3.9	7.4	8.9	6.9	10.4	3.5	12.4	8.6
November	4.5	6.2	11.4	8.5	11.3	2.3	10.2	9.0
December	5.0	2.3	10.2	7.2	9.4	7.6	9.5	7.6
1941								
January	4.4	6.6	10.5	5.3	12.8	3.8	9.7	9.0
February	8.2	7.6	12.1	6.2	14.6	3.4	10.4	10.5
March	10.0	10.7	14.7	5.7	13.3	2.1	9.3	11.7
April	14.0	9.1	15.1	4.3	16.0	8.0	6.6	12.5
May	15.4	9.7	14.5	8.4	15.5	11.4	12.0	13.0
June	14.9	12.8	15.3	10.2	12.7	13.7	11.4	13.5
July*	18.0	14.6	14.5	10.5	9.7	14.8	13.5	13.6

* Preliminary.

TABLE 4—GENERATING CAPACITY UNDER CONSTRUCTION OR PLANNED
Kilowatts

	1941	*1942*	*1943*	*1944*
Electric Utilities	2,126,400	2,344,000	2,292,500	343,000
Municipal Utilities	475,300	115,000	75,000	90,000
Federal Government	560,300	768,000	660,500	948,000
District Projects	308,500	.....	.....	.....
Total	3,470,500	3,207,000	3,028,000	1,381,000
TVA Supplementary Program			750,000	350,000
			3,778,000	1,731,000

Easing Your Priority Problems with Reclamation

By K. C. Campbell
General Storekeeper, The Detroit Edison Company

EDITORIAL NOTE: *The supply of certain materials is short. Man hours of factory labor likewise are precious. The rearmament program, now in the productive stage, largely preempts the supply of aluminum, copper, zinc and steel. Equipment and supplies reclaimed and put into service saves materials and most of the labor that went into their production. Hence salvage operations now have a patriotic character; they ease the strain on the nation's resources and thus contribute materially to national defense.*

The salvage pile is the one source of supply still within the control of the utility itself. No priority procedures and procedural delays are involved in procurements from that source.

Mr. Campbell's suggestion regarding interchanging of both used and new surplus parts deserves serious consideration by the engineering committees of the E.E.I. At present, urgent appeals are frequently reaching OPM for priorities on particular repair items or on some item urgently needed to complete a new installation. If an aggressive reclamation policy is generally adopted and a medium established for letting wants be known, utility companies finding themselves greatly in need of a particular type of motor, a bushing, a pot head or other such item, could often quickly locate in neighboring companies' stores just what is needed and obtain it promptly, to the advantage of all concerned, particularly of the overloaded Priorities Division of OPM.

IT is hardly necessary to point out the scarcity of basic materials and manufactured articles. You already know that a great deal of what is available is subject to priorities and that deliveries in general, priorities or no priorities, are much slower than they were in normal times.

Government agencies have repeatedly announced that the procurement of materials for non-defense purposes will become more difficult. Priorities for facilities related directly or indirectly to defense projects will have the right-of-way. In the face of these pronouncements, utilities are expected to give service also to many applicants who have little or no connection with defense work. Reclamation is a partial answer to this problem.

In normal times the reclamation of used apparatus and materials in a public utility is good business and can be conducted on a money-saving basis. Developments of recent months, however, have made a considerable change in the picture and the saving of money is no longer the prime incentive in conducting this work. The conservation of materials which may be re-used instead of being junked is now an obvious duty which we must perform to the best of our ability.

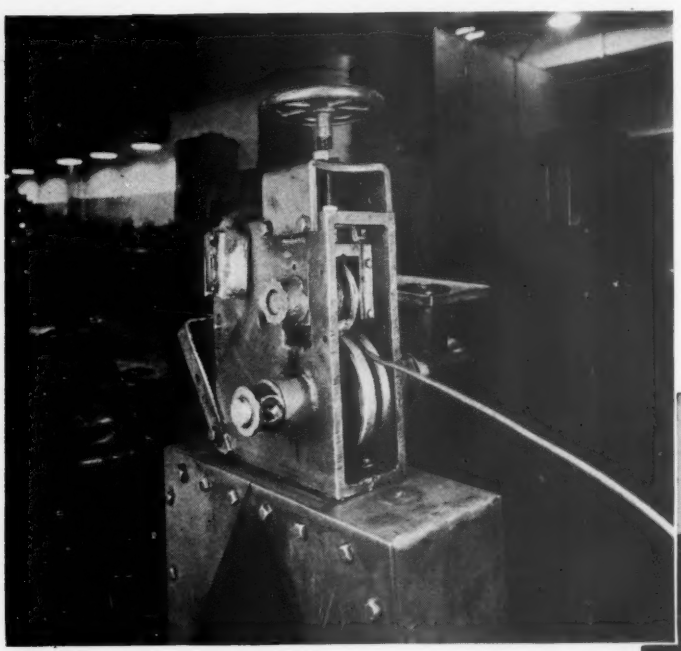
Every utility is in the business of handling salvage materials, whether it likes it or not and is, therefore, faced with the problem of what to do next with a great variety of second-hand equipment and material. Obsolescence, inadequacy, maintenance and rebuilding work are the main reasons for the removal of such materials from service.

It is assumed that every public utility is sufficiently interested in this subject to investigate the phases of reclamation work with which it is not already acquainted. There are numerous possibilities which can be discovered by your own efforts supplemented by a thorough look into what has been done by others. Salvage material can become a valuable source of supply and it is reasonable to believe that the Purchasing Department's expense could be materially reduced on that account. In one company, the gross salvage business from 1936 to 1940 inclusive averaged $1,100,000 per year, of which amount nearly 90 per cent was reused within the company.

A concrete suggestion which might well be followed by every utility company is this: No matter what your present set-up is in respect to the custody and disposition of apparatus and materials removed from the system, halt the conversion of any of it into junk until its possibilities for further use within the company or interchange with other companies are thoroughly studied. If you junked such items yesterday it may be advisable to use them today. Take nothing for granted and above all take nobody's blanket assurance that everything possible is already being done.

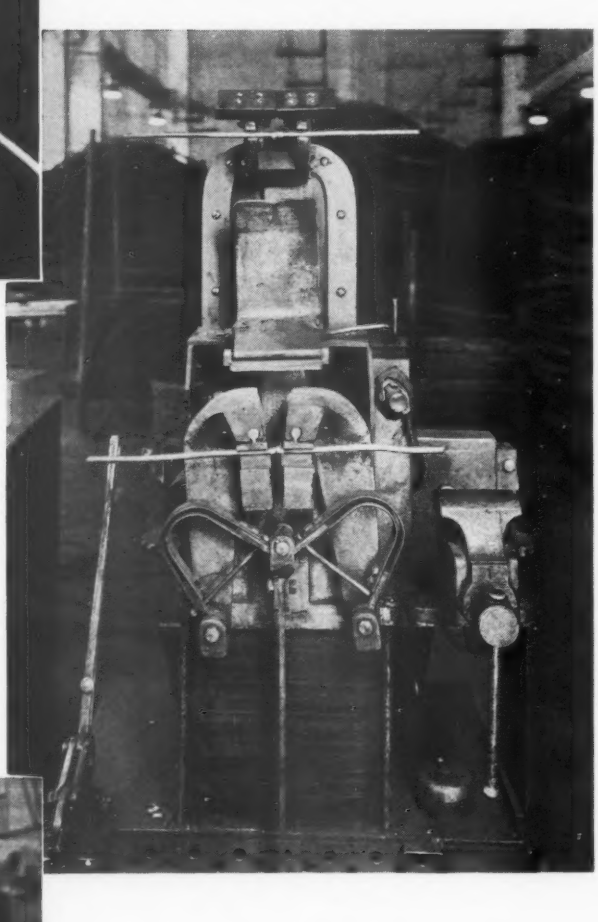
No company is too small to get something out of reclamation work, nor is it always necessary to create another department to handle the work. If the volume is too small for a full time job, it can be assigned to some existing department or to some individual. It is probable that there are many small plants or shops about the country which have no defense contracts or sub-contracts nor have they the materials to conduct their regular businesses. Some of these may be glad to do reclamation work for utilities not equipped to conduct it themselves.

Because of the changes constantly occurring in all public utilities there is a continual inflow of used apparatus and materials from all parts of the system. No utility can escape this and unfortunately the potential value of some of it for re-use is not always fully realized and it may end up in the junk pile. Junk in itself cannot be overlooked as a valuable resource but it is much better to make use of the material again and conserve the increment which represents the manufacturing processes, the hours and



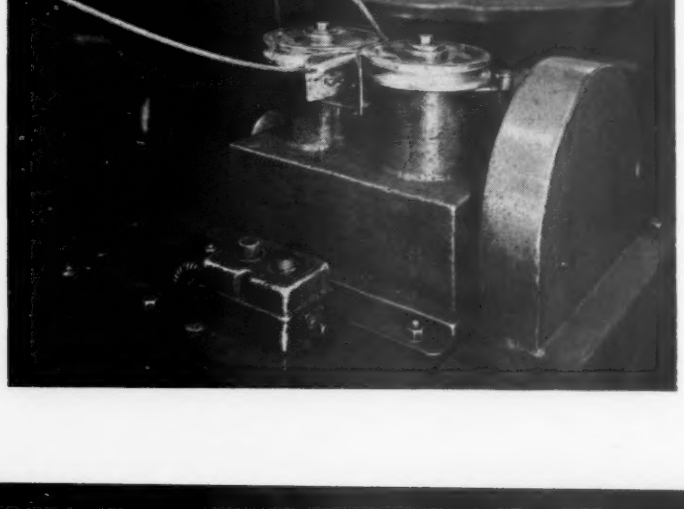
W. P. WIRE STRIPPING MACHINE

Left—When the braid of W. P. wire has become worn and ragged and cannot be reclaimed merely by dipping in insulating varnish, the braid is then removed by drawing the wire through a home made machine which cuts the top of the braid and by dragging the wire over a scraper at the front of the machine the braid is removed from the conductor. The copper is at the same time spliced and then coiled into coils of approximately 350 lbs. each and returned to wire mills in carload shipments for rebraiding. The old insulation is disposed of as rubbish.



BUTT WELDING MACHINE

Right—This machine is capable of welding solid copper wire from number 8 B and S to 4/0 B and S. The copper wire is cut in a cutter which gives a special shape to the ends, which during the welding operations allows the oxides and dirt to flow to the outside of the weld. The ends of the wires are butted together and held in place by the jaws of the machine. The flash guard is then lowered and the foot pedal pushed down which closes an auxiliary switch allowing the current to flow in the conductors fusing the ends of the conductors together. At the end of the travel the jaws cut off the current, allowing the weld to cool. Hard and medium hard conductors are then annealed in a special annealer at the top of the machine thus relieving the stress at the weld. Wire to be redrawn at the wire mills has all joints dressed down to the size of the wire to allow it to pass through the dies.



ALUMINUM AND COPPER WIRE SPLICING

Left—The rolled sleeve method of splicing is used for aluminum wire the same as is used for copper wires. The aluminum strands are fanned out from the steel wire and the steel wire is painted with red lead paint after which it is coated with carborundum dust and the aluminum strands wound back in place. The conductor is then inserted in an aluminum sleeve and rolled in a Splicing Machine. For copper wire a specially developed short copper sleeve is rolled directly onto the wire. This sleeve is tapped inside with British standard nut threads and has the same holding power as a plain one four times as long.

skill of the American workman which are now so vital for defense purposes. Furthermore, it approaches absurdity to let usable material slip through our hands, go into the junk pile and then through the whole cycle of manufacturing, distribution, etc., while at the same time our own or other companies are possibly obtaining priorities for the identical material and waiting patiently for delivery from the manufacturer.

The fear of letting down the bars to the use of inferior materials and apparatus need not deter companies from reclamation work. Reclaimed items should be rigidly inspected before acceptance for re-use. Standardization of materials may have to be temporarily modified or suspended as far as changes to newer types or styles is concerned but standardization's desirable features such as reduction in sizes, types, etc., may be fully utilized.

The inspection and testing of reclaimed material and apparatus must be carefully conducted by an impartial party, preferably the same one who does this for the new materials from the vendors. The standards of good materials and good workmanship should be carefully maintained and the specifications for reclamation should be well understood both by those who do the reconditioning work and those who re-use the material.

Purchasing Agents can render valuable assistance in utilizing salvage materials by having all purchase requisitions scanned by somebody who is familiar with salvage material on hand. The description of what is requisitioned may not tally exactly with what is on hand but sometimes by the exercise of imagination and ingenuity the latter may be utilized.

In starting or expanding reclamation work, public utilities should naturally consider items which are most useful, are easiest to handle and which require a minimum of special tools and equipment. Wire, poles, hardware and small electrical and mechanical equipment come in this class. Practically all companies now re-use the best pieces of second hand wire but until they have gone so far as to use for various purposes all pieces down to tie-wire lengths, there is room for improvement. Fortunately, an excellent showing in many classes of work can be made with simple hand tools supplemented by the occasional use of small machine shop equipment.

Every company should have a point designated as a headquarters to which materials removed from the system may be sent for listing and inspection pending final decisions as to its disposition. The departments in which the material originated should surrender it immediately after it is removed even if they have to be consulted later as to its disposition.

The person who is placed in charge of reclamation does not have to be a "super-engineer" who can do things with salvage material that ordinary engineers cannot. Rather he should be somebody, preferably with appropriate training, who can intelligently correlate the work among the existing departments of the company and whose prime responsibility it is to get the most out of the material. Naturally he acquires a valuable general knowledge of such materials and can visualize through experience certain things not immediately apparent to those ordering and using materials. The credit for anything achieved is shared by all who participate in the general reclamation program.

It is quite usual and fitting that the storekeeper assume the custody of all material removed as soon as it can possibly be turned over by the departments which formerly used it. The problem of disposing of material flowing into the warehouses through salvage channels has to be solved or else the warehousing facilities would soon be over-taxed for room.

Every company should have some person or department designated as the custodian of material removed from service and that person or department should also conduct the reclamation work. It should not be necessary to emphasize that such work should not be hampered by insufficient authority. To do the work right, the person or department must have the respect and the cooperation of all company individuals and departments.

Another matter closely allied with reclamation work is the interchange between companies of surplus apparatus and materials, both new and used. This has been tried in a small way in the past, but when new material was readily available it was not very successful. Under present conditions it may be possible to promote the use within the industry of such items as are not needed by one company and may be very useful for another. Lists of such material must be carefully prepared and to do any good, they must reach the proper parties in the companies to which they are sent. This requires full cooperation within companies and between companies.

This possibility of interchanging seems so important at this time that I recommend that arrangements be made through Edison Electric Institute Headquarters or through EEI's existing engineering committees for circulation of such information. This should effect such prompt action that one company's requirement for apparatus or materials may in many cases be met by what another company can well spare.

Any company interested in any phase of reclamation work could write in to EEI Headquarters and through the new facilities thus afforded for the interchange of such information, they would be able to promptly get the best answer available within the industry. Furthermore, any company wishing to inspect the actual reclamation operations conducted by another company would be able to make mutually satisfactory arrangements through Headquarters.

The Salvage Division of The Detroit Edison Company

It may be of interest to describe briefly one of the existing salvage divisions in a public utility to bring out how it operates and what methods it uses in reclaiming some of the typical items.

The Salvage Division* in this company is a branch of the Stores Department and by executive order it assumes full charge of all apparatus and materials removed from the system and in addition to this, left-overs of new material not used on account of changes in plans, etc. The Salvage Division has no field force that actually removes material but enough field work is done to insure that material is not needlessly damaged in removal. In some cases the departments from which the material comes are notified in advance that certain materials will positively be junked and this tends to lower the removal costs.

After being removed the material is tagged and sent to the Salvage Warehouse. It is then inspected and listed

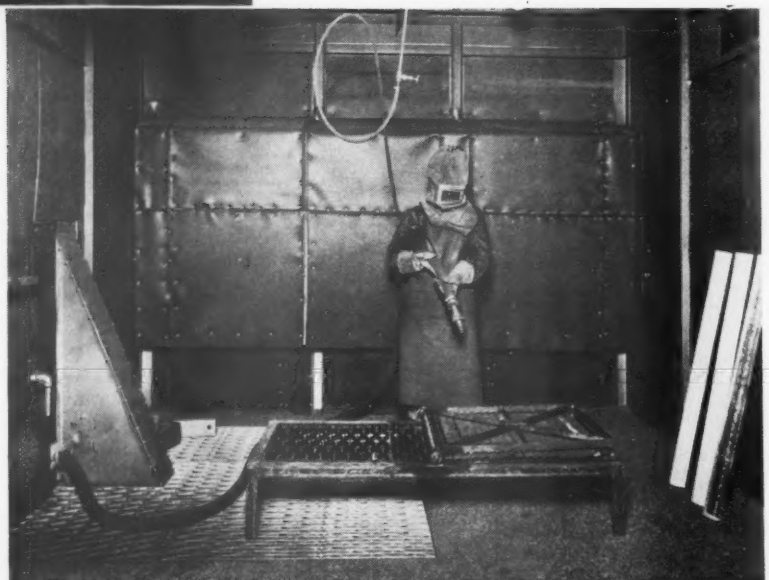
*Details of Salvage Operations in the Delray Salvage Shops of Detroit Edison appear in an article by Mr. Campbell in the February, 1939, E.E.I. Bulletin ,pp. 65-69.

RECLAMATION OF BOLTS

Left—All bolts are first sorted for size and for condition of galvanizing. Bolts that have marred threads are reconditioned by a special split die which is clamped on the threads and is run backward off the bolts instead of cutting the thread onto the bolts in the usual manner. This process protects the galvanizing and also pushes the threads back into their original position. New nuts are installed and the specification for this class of material calls for all nuts being run up and back the full length of the threads on the bolts. Bolts requiring regalvanizing are either hot dip galvanized or zinc sprayed.

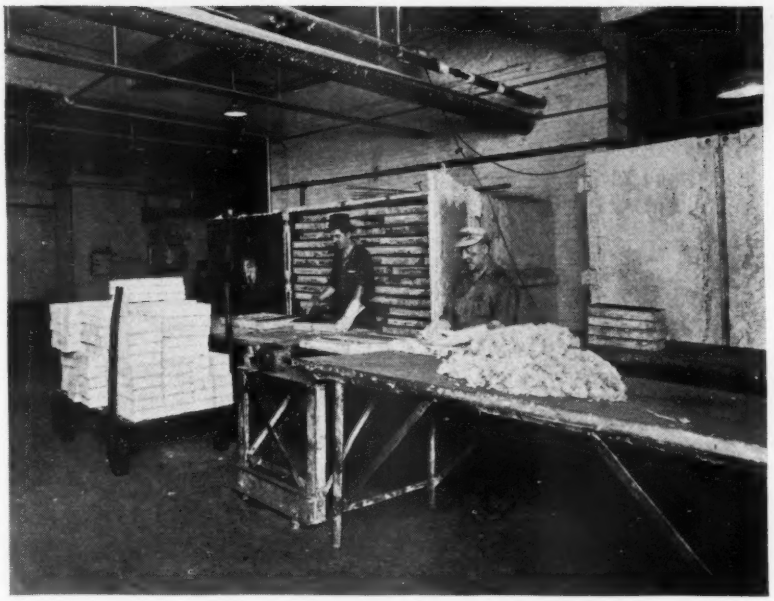
RECLAMATION OF OVERHEAD LINES HARDWARE

Right—In the regalvanizing of overhead lines materials it is essential that all rust be removed. This is accomplished by an air blast and finely crushed steel shot.



RECLAMATION OF OVERHEAD LINES HARDWARE

Below—After cleaning by blast, zinc spray is sprayed on the material by a special gun. Any metal can be deposited by this apparatus.



MAGNESIA BLOCKS

The broken pieces of magnesia pipe covering received from removal jobs are ground and mixed with water to form a mortar. This mortar is then cast in pans and dried in a hot air oven. This material is used for lining preheated air ducts in power plant construction.

pending the decision of the Salvage Engineer. Three things may happen to it:

(a) It may be junked immediately—in case of some of the larger items this may be done at the source to save re-handling. The present conditions in connection with the procurement of new materials have forced us to reconsider some of the items which we formerly scrapped and more of this will be done as the necessity arises.

(b) It may be carefully listed and stored. Items in this class may be re-used or if not needed may be sold outside. Items which do not move are reviewed periodically.

(c) It may be immediately processed for re-use.

In cases where the chances for use within the company or for sale are very uncertain, no reconditioning work is done at the time of receipt. The reason for this policy is obvious as such work would be wasted if no use appeared and also certain alterations may be necessary in case a use developed and the work would have to be done over again.

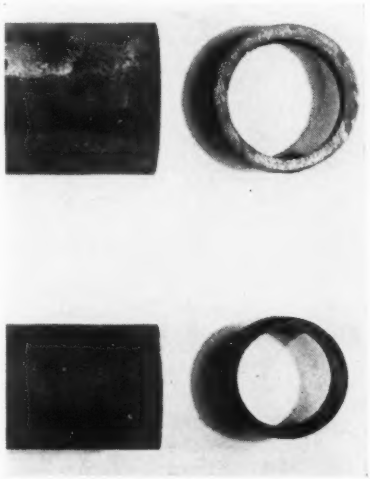
It is this class of material that needs close cooperation from using departments and vigilance on the part of the Purchasing Department and Salvage Engineer to see that no opportunity is missed to utilize it. Many instances could be cited in which items are rebuilt for uses different from those for which they were manufactured. An aggressive policy of finding a use is preferred to a passive policy of waiting for a customer and on these lines we have had considerable success.

Reclamation Methods

Some of the methods employed in reclaiming apparatus and materials are here briefly described:

Weatherproof Wire

Yearly checks indicate that about 90 per cent of all weatherproof wire removed from the system is processed and re-used by us. In 1939 and 1940 this represents about 1,250,000 lbs returned to stock in each year.



PIPE RECLAMATION

One of the large items of reclamation is the redrawing of boiler tubes into pipes of varying dimensions. This material is used on all jobs when black iron pipe is specified.

The principal salvaging operations are as follows:

1. Splices made with rolled thread sleeve joint.
2. Splices made with an electrically butt-welded joint.
3. Short lengths cut into tie wires.
4. Short lengths cut into extension leads for transformers.
5. Short lengths cut into pigtails for ground rods.
6. If insulation is defective, it is stripped from the wire which is then spliced and returned to the wire-mill for re-insulation. Some sizes are re-drawn into smaller sizes at the mill and are then re-insulated.
7. Remainder of wire has insulation burned off in a special furnace and it is then sold for scrap copper.

Our high percentage of reclamation is due to our routing the second-hand wire through the one point and finding so many uses for the shorter pieces. Also during 1940 we had 350,000 pounds re-insulated which would ordinarily have gone to the scrap pile.

ACSR Wire

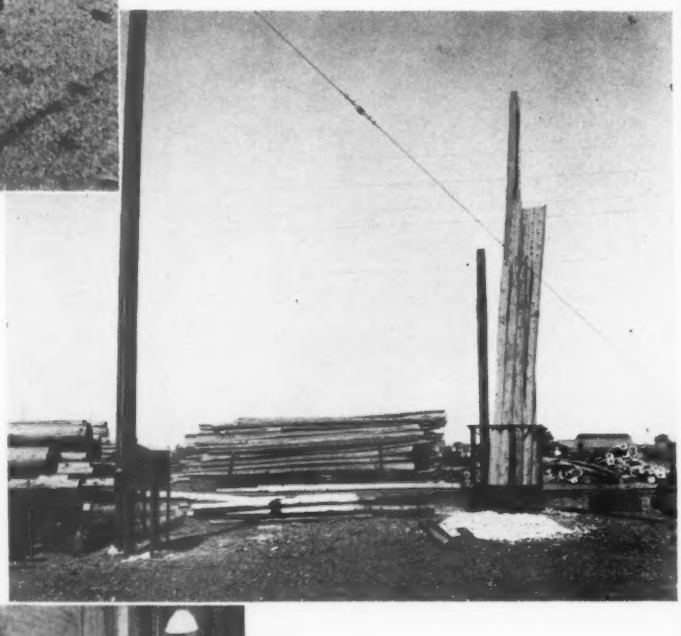
This is seven strand No. 2 and No. 4 with a steel core and it is spliced with a rolled sleeve joint. Aluminum alloy sleeves are used and due to the slippery nature of the metal, it is necessary to dip the ends of the conductors in red lead and carborundum grit to insure that the sleeve will hold when it is rolled on.

Overhead Lines Hardware

All second-hand hardware is sent to the Salvage Division by the various warehouses to which it is returned by the line crews. If the galvanizing is in good condition and the articles need only cleaning, straightening or replacement of parts, this work is done at once and the material is returned to stock. As for items on which the galvanizing does not pass inspection we formerly sent some out for dip-galvanizing and had the balance spray-galvanized in our general company shops. We are now unable to get dip-galvanizing done at outside vendors and are experimenting with substitutes for the spray-galvanizing with zinc. We have every expectation of finding an acceptable substitute for zinc to use in the spraying process. At the worst we would rather treat the hardware with a comparatively short-lived rust-preventative than to allow it to be junked. Certain items of hardware which were formerly junked as fast as they came in from the system due to changes in standards are now being retained for possible further use.

WOOD POLE RECLAMATION

Left—Cedar Poles that have decayed sap wood are shaved free of all decay with a motor-driven rotary planer which has certain advantages as compared with the hand Draw Shave; 1, it will do 50 per cent more work; 2, it makes a better looking job. There are no knot nubs left; and 3, it remains sharp longer and can be resharpened in about 15 minutes, while sharpening a Draw Shave requires from one-half to one hour.



WOOD POLE RECLAMATION

Right—After all salvage operations have been performed on the pole as the removal of decayed wood, cutting back into shorter lengths and framing, the pole is given a standard hot and cold creosote oil treatment.

This treating tank is made from an old transformer casing and is nine feet in diameter and eleven feet deep. This tank is fitted with five 5-kw electric treaters so wired that either two or three or five may be on. The total cost of this treating tank was about $160.00.

RECLAMATION OF LIGHTNING ARRESTERS

Left—This work requires the replacing of broken caps, splicing of leads and making of miscellaneous external repairs. Internal mechanism of lightning arresters is not disturbed and in no case are they rebuilt. After completion of repairs they are given a di-electric and a surge test to check the operating characteristics.

Plain Talk on Public Relations

By Kimball Jack

Advertising Manager, Washington Water Power Company

IF there was ever a business group whose persecutions merit the martyr's thorny crown, it is the electric utility industry today; and if ever the politician took advantage of this martyrdom to heap still greater persecution, the case in point takes all precedent. It is to be supposed, therefore, that an article written to clarify public relations in the industry should echo deep and abiding tones of sympathy. This, however, will not be done. The time has come when someone must speak honestly and openly, when some severe thing must be said to stimulate action if the industry is to survive.

Even now, before pen touches white paper, I can hear some of our mighty generals of industry rumble, "Who is this man to expound happy relations with our public? Have we not directed great institutions for thirty years? Are we not numbered among Podunk's best families?"

Verily, humble me! I tremble at my own presumption. Over stooped shoulder I glance, expecting the thermometer to drop twenty degrees as these overlords look at me. Who am I indeed? Neither lawyer or broker ever fraternized with the shingle on my door, or gave me a clue. So the secret is out. I was a small-town school teacher, coming to the electric business very timid, with my mind as blank regarding big business as the Arctic is of sand dunes. Public utility lamentations that have since dinned my ears, and which are now worn so thin they have to stand twice to cast a shadow, were then quite unknown to me. Better public relations was a novel phrase that had no part with electricity. In fact, the only thing to my credit was a curiosity to know why the private utility and Mr. Public seemed to throw rocks at each other, and why Mr. Public made greatest headway. Ten years have taught me much.

For in that period of time I have passed through nine bitter public ownership elections, and have analyzed literally thousands of interviews with customers, all of which have left me with the surprisingly simple conclusion that the industry is largely to blame for its present plight.

Perhaps the most amazing thing about it all is the fact that our top executives, as individuals, can teach Dale Carnegie many fine points in making friends. They appear in public and are congenial and polite. They never think of boring their associates with a dull recital of personal ailments. Family and financial matters are taboo. They are humble as become gentlemen. Yet these same skillful students of human nature commit unpardonable blunders when directing the behavior of the institution.

What is any institution except a personality, and in presenting this personality to the public, these same executives violate every rule a dumb salesman is expected to know. It is regrettable, too, from the standpoint of our persistent repetition of these blunders, that the customer, after all these years, is still a complex bundle of emotion, with definite habit tendencies, and who has a sense of pride, fair play, and ego; and that men and women react against the patronizing behavior of the institution just as they resent personal patronage; who shrink from the utility's ill-mannered table talk about self, just as they groan under a visitor's recital of personal matters; who are quick to detect artifice, clever manipulation and the least appearance of irregularity.

Elemental though all this sounds, still one fact looms to gigantic proportions. It is this: when utility executives are so steeped in kilowatts, accounting practices and merchandise sales that run to the thousands; when customers are counted like so many sheep, and the net result is that thirty to sixty per cent of the people in the United States willingly vote utilities out of business, regardless of promised reform, something is basically wrong. Furthermore, it is worth an attempt to get to the bottom of it.

Contrary to popular opinion, the public is not naturally antagonistic toward big business in general, or the electric industry in particular. The public is not predatory, takes no delight in wanton destruction, and makes no unprovoked attack. Society is by nature unruffled. Take a moment and examine society, one man at a time. You see him occupied with his own problems, a harmless individual in his busy, limited world. Glance through the window of his home. In the morning he arises already late for work, eats cereal, and swashes it down with coffee. If he kisses the wife or stops to shout at the kiddies as he trots off to a day of irritation and toil, it is because extra haste gained him an extra minute. At noon he may stand at the counter, or on the street corner, an old sluggard. Sundays he sleeps or goes to church and ponders the advice that it is never wisdom to purchase pleasure at the price of pain, or he reads the newspaper to satisfy a slight curiosity regarding Little Abner, war, baseball, homicide and Hollywood. A word may have fallen from his lips during the week about his electric bill, along with the price of gasoline, but nothing more. His problem is food, clothes, a job, amusements which an untiring wife proposes, and a few friends.

Attempt, if you will, to shake Mr. Public from this deep and abiding interest in his own problems. Try to enlist his support in a local parent-teacher group, a mass meeting to create a playground; ask him to call his congressman to protest infringement upon freedom of speech, or to keep his son out of war. You can hardly stir him with dynamite. There is no chip on Mr. Public's shoulder, no driving force in his heart. He does not brood about the utility. He does not lay awake nights thinking unpleasantly about kilowatts. Live and let live governs him. Mighty crusades to change the world, to improve it, to destroy it are left to the erratic, restless few. The average citizen is not an

enemy of big business, nor of the public utility. Mr. Public's biggest fault is indifference. He has worries of his own.

Many have been the attempts of political reformers during the past hundred years to prejudice public attitude toward big business. These attempts, ranging over real estate, manufacturing, oil production, chain stores and finally our music publishers, often collapsed because general interest was lacking. In fact, a tendency seems to reoccur in many instances on the part of society to show partiality for the besieged. When the agitator expected torch parades and pummeling, the public snickered and then booted the agitator instead.

Numerous buy-at-home movements have been completely ignored. The public would have no part in ousting from the local picture mighty merchant intruders. Cooperative gas pumps that were meant to substitute for more capitalistic-looking stations have rusted in idleness. Contests between prosperous factory owners and agents of socialism have resulted in tar and feathers to the interloper. With few exceptions, our big industries which had sense enough to tread common ground with the populace, have been given wholehearted support. Prices seemed unimportant. Wealth accruing to the owners of business may or may not have aroused protest. Take our motion picture industry, or some particularly wealthy individual emerging from boom periods. The terms "cost" and "price" take prominence in direct ratio to Mr. Public's dislike for the merchandise, or the firm that sells it. If he likes a thing, whether merchandise, or a maid or government, it is not costly. If he dislikes it, any price is too great.

It is not necessary to go back to the Cambrian period to see how our little friend, Mr. Public, got on with the great hulky creature our senators compare to the utility. In early stages of electrical development, man and monopoly lived side by side without friction. The monopolistic dinosaur breathed and reached out, walking clumsily yet humbly over the little man's field, while the man gazed after him with mild interest, and offered bits of green foliage with his own hand. In early days, private utilities were definitely not hampered. Public bodies, this thing we call society, never showed any real tendency to reach for the bean shooter until after the monopoly got fat and sassy, nibbled at Mr. Public's hat, shoved him out of the hammock, and told him to meet at high noon over the hill by the bubbling spring, when in reality the clever creature meant to slip around to the kitchen for another helping.

Public disfavor began to foment in most instances only as a result of injustice or injury to individual self-esteem. When management permitted the firm to develop ugly table manners, when the customer's ego was at stake, his self-esteem minimized by contrasting power, when fair play was trampled underfoot, then and only then was an attitude of resentment created toward the utility which persists today even in spite of our finest advertising logic and despite all effort to the contrary.

Human nature does not reverse itself, or change just because an individual has dealings with a business institution. Members of society do not like men who are inclined to boast overmuch; who constantly remind us of their generosity; humans resent a display of wealth, not the possession of it; and they dislike the man who assumes that people are too dumb to know when he attempts to outsmart them. If these dislikes characterize man's relation to man, then why should we expect customers to react differently when corporations, the utility, blunder in these same delicate matters of human understanding?

Take, for example, the customer who calls at the utility's office to protest the setting of a pole in his back yard. Corporate indifference may have marked his attitude when he entered the door, but he leaves with a deep emotional change if his ego is affronted. Take the utility employee—auditor, salesman or department head—visiting in a small town. Let him, with an air of reckless importance, pour easy dollars into the slot machine, or call for little extravagances with abandon, or drive a large car when a smaller automobile would have sufficed. Let him do all this in a small community while a representative of the local "have nots" watches from a humble corner, and the war is on. You have an emotional reaction that lives forever. Let the customer who sold his last dozen eggs to pay the tax bill see the morning paper carry the utility's ad, telling of $50,000,000 taxes paid so cheerfully and ably. Little soul that our customer is! He needs a new shirt. He has nothing, while the utility talks in terms of millions. There is only one consequence. Resentment rears its fiery head which no blade can mow down.

Why shouldn't the utility pay taxes? Who doesn't? Why shouldn't it have a payroll? Is that a distinction? Why shouldn't it make local purchases? Is there something novel about that? Why shouldn't it support the community with contributions to the community chest? Even the poor working man does that. Yet while the average man, the average firm humbly accepts these things as ordinary requirements of living, the utility fills its lungs and points to its millions.

Monopoly in itself does not create bad public relations. The following of masses after dictators proves that. The comparative well-being of the telephone company, municipal electric systems, city water systems, garbage departments—all this proves it again and again. Contrary to popular hue and cry, monopoly does not in itself create enmity. Some utility executive was looking for an excuse when that thought came into being. Soon other utilities climbed in the martyr's row, repeating a martyr's alibi. "People dislike us because we are monopolistic," they said. Please, gentlemen, accept this one humble observation: if the public dislikes the utility because it is a monopoly, the public got that way one man at a time. Has it not ever seemed strange that our friends find no objection to monopolies? Objection to one place of business comes only after the customer's emotion turns sour. After that his anger increases because he has no other place to turn.

Extremely doubtful is it that were it not for these personality traits so irritating to the customer—boasting, taking credit when no credit is due, displaying wealth unnecessarily, cleverness—our so-called structural evils pointed to by the politician would evoke no more than a passing thought. Usually the public is not greatly impressed by mere name calling. For the reformer to cry "pig, crook," or "thief"—well, it simply drops into comedy, into so much burlesque. It is like calling a cow a whale, or a man a turkey buzzard. The emotional attitude must be already stirred if name-calling is to be taken seriously. The emotional charge must have taken a positive or negative turn, just as litmus must have started to turn blue or red.

Recall how people regaled Robin Hood. Recall how sweatshops, factories, political machines, regardless of size, regardless of cost, have been tolerated in proportion to the amount of skill that was shown in dealing with the public.

Evils of the utility can never be traced to high rates, or taxes, or poor service, or the failure of utilities to take part in the community. These things have little to do with public relations, the advertising expert's full-page ads to the contrary notwithstanding. The public thinks primarily as a result of how it feels. It feels according to the treatment each individual receives.

It is here that the politician steps in. With an eye not so much to a lucrative industry as toward a group susceptible to rabble-rousing, he begins his attack. Half a dozen industries in the nation offer greater capital investment, more profit, more spectacular operations. Sound public relations place them beyond his reach. If he started something, the public would yawn with ennui. Like pathogenic bacteria, the politician, the socialist, the economic ne'er-do-well chooses a business body whose resistance is already low.

"Your rates are too high," asserts the politician, and raising an eyebrow, Mr. Public, already prejudiced, echoes the phrase. "Your money flows back to Wall Street," continues the politician, and the cry is at once taken up. "The utility spends vast sums to control politics," and sour Mr. Public nods his agreement.

What actually has taken place in Mr. Public's mind is this: he has found articulate expression for an emotional attitude previously beyond any kind of definition. Political accusations, stock phrases become flimsy excuses. Any intelligent mind recognizes this. The original cause of the customer's emotion may be long forgotten, or, if remembered, remains unspoken. People do not talk about the most powerful, all-inclusive factor in existence, the ego. Memory is too vague. Pride is too strong. Nevertheless, resentment persists, and upon the slightest provocation, retaliation, like eczema, breaks out in a new place.

Ask the man who votes against the utility to obtain lower rates what rate he pays, and ninety-nine times out of a hundred he does not know. In one small Idaho town the municipal rates stood at twenty cents a kilowatt hour, yet customers were not particularly concerned about the cost. "It's worth it," they said. In another locality, customers were paying less than three cents a kilowatt hour, yet they said they were being robbed. Ask the man who votes against the utility to prevent money from flowing back to Wall Street where his money goes for automobiles, chewing gum and municipal bonds. Usually his answer is a grin, and to some other empty lot he must look for a better excuse.

This very natural tendency on the part of customers to rationalize their emotional attitudes explains the peculiar inconsistency that always exists between reasons for ill-will and truth as it swarms in the open. It also explains why lower and still lower rates at times fail to remove antagonism, and why the utility's measures for appeasement, whether through advertising or operating reform, amount to little more than chasing butterflies. For no matter how often we whack off the apparent heads of public ill-will, another rodent climbs out of its hole with something bigger and better. High rates, political meddling, financial structure are excuses only. It takes a skillful public opinion survey to bring out the truth as to how people feel. And then we get the shock of our lives. From twenty to sixty per cent assert that even if electricity were given at cost, they would be most happy to get service some other way.

II

Now we come to the next step in our inquiry into public relations. We have attempted to show that public disfavor is generated in one customer at a time, and only as rapidly as he is exposed to ill-mannered practices. With all signs pointing to the conclusion that cleverness, greed, boasting, arrogance and loud crying, have been at the seat of most public disturbance, and that such elements as political attacks, high rates, financial structure, and charges of monopoly carry only minor importance, the question arises: what can be done to regain public favor?

A few utilities have already traveled far toward this goal, and included in our list is a pioneer company in the Pacific Northwest. For in spite of government power competition, the like of which this nation has never seen; in spite of political pressure, and all the rabble-rousing tactics known to a rabble-rousing age; in spite of a promise to the people of cheap power, and the elimination of operating evils, public good-will was twice evidenced at the polls by a sizable majority. The list of this western utility's friends, as a result of common sense management, grows every day.

Just what corrective measures have our few alert utilities undertaken? While other firms blindly pour antiseptics on the surgical instruments, while quack advertising experts feed the customers great spoonfuls of patent medicines, what do these successful utilities administer to the patient?

First, the board of directors, choosing their own physician, must elect to head the company, a man who, above all else, has a thorough understanding of human nature. The expression of General Motors to the effect that business must "learn what customers like and do more of it; and learn what customers dislike and do less of it," is taken as the ten commandments of procedure. The new-day presidents have a background that includes the common people. Prudery, arrogance, and snobbery are as foreign to their natures as they are to any good shepherd. The executive who assures his fellows with oral reminder that "he makes it a point to be on common footing with the working man" has no place as an executive in the utility business, for the very fact that he is conscious of effort precludes him from public acceptance. His intercourse must be sufficiently natural that when he eats with them, talks with them and makes policies in their interest, he finds it the most ordinary and agreeable thing in the world.

Once a president is found who is both capable and sincere, who is not above rubbing elbows with a lunch basket, the second step comes easily. Pleasant and surprising will be the public reaction when he announces that anything the company does by way of rules and policy will be changed in a day's time if someone will show the company a better way to do it. This willingness to cooperate, to adjust differences, to serve cheerfully, opens the way for unlimited and rapid improvements in public relations.

Perhaps no greater reform can come to the utility than that change of heart the preacher calls repentance. Ceasing its role of a powerful, wealthy benefactor, a big taxpayer, a good citizen in the community, the utility can disarm thousands of reasonable objectors by donning sackcloth and evidencing genuine humility. People do not envy the miser who hobbles by in unkempt garb, no matter how much wealth he possesses. Humility seldom incites enmity. Take the sub-department head who murders good relations by squandering an unlimited expense account throughout the territory. He should be routed by night-

fall. Strip him of his grasp on the company cash drawer and he will become a different breed of horse, and will browse in a different pasture. He is at the seat of enmity, avarice and greed. Give his expense money over to the credit department, which has the tougher job and needs definite material reenforcements.

Why should the manufacturer need feting, anyway, or department heads cater to golf companions and cocktail buddies? Such friends need no persuasion. But when an irate customer is refused credit, when a customer comes in to pay her bill after the lights have been turned off, an expense account comes in handy. Here the credit manager becomes a hero. Reaching into his private file, he presents her with a beautiful deck of playing cards, or a trinket for the kiddies. Resentment melts under this extraordinary kindness, and money is spent where it will do good.

Take the matter of office quarters. Whom does the top executive try to impress by erecting a marble edifice with gold plated coat of arms over the doorway? Is it the lowly rate payer? Is this show of finery meant to win admiration and esteem? Man against man, it doesn't. We despise diamonds and patent leather shoes and earrings. Take the hint, neighbor. Move the office headquarters to the warehouse. People will not covet or resent that. It may hurt your pride, but it may also save your necks.

Take the matter of memberships in service clubs. Utilities have a reputation for aloofness and the attempted control that comes as a result of large memberships. It is quite natural for six utility men to sit together rather than mingle with various secretaries of the flour mill, irrigation company and water works, but this practice does not make friends. If utility men are not smart enough to desire fresh views such as are gained by intermingling, they should be fired and others hired. If utility employees cannot resist each other's company in public gatherings, then restrict the membership until sheer loneliness compels them to partake humble porridge with the ice man as a good neighbor should.

Take the matter of newspaper advertising. If any other business in America has been hoodwinked by the copywriter into so many false premises while striving for public good will, it has not come to light. If there was ever a quack that caught a sick man unawares and gave him poison, it is the average advertising expert. What do advertising men know about human nature? A few taught arithmetic in high schools; some reported on newspapers; some showed a flare for drawing; some of them, out of sheer destitution, opened an advertising office and instantly metamorphosed into specialists of human nature. What skill do they show by way of recognizing the hates and fears of people, or making friends?

An advertising man's business is to sell advertising, and if the illustration looks right, and the copy runs smoothly, he recommends the dose even though it kills. Quarter-page, half-page ads, some in color, artwork costing a fortune, are supposed to dazzle the customer into thinking of something besides the real issue. Advertising is the utility's second greatest evil. Here we have a picture of the company's new generating plant, and few executives can resist it. The ad is supposed to make people like the company by showing a picture of one of its plants. Fancy yourself trying to win an impoverished, irate neighbor by such a method. You send him a picture of yourself, with a listing of thoroughbreds on your estate, the number of acres you own, the price you pay your chauffeur. Yet the utility does just that. Or the advertisement shows a picture of all company employees, trying by some magic hocus-pocus to crowd out an emotional attitude in the customer's mind with bits of tinsel. Fancy yourself trying to win the friendship of a stranger by telling him about your family tree, your illustrious ancestors, your prolific sires.

If a company salesman committed such folly, you would fire him without warning. The salesman is taught to talk in terms of the customer. "How are you, Mrs. Jones," he asks. Stupidity would be the word for it if he asked, "Mrs. Jones, how am I?" Yet the utilities do just that.

Here in America are one hundred and thirty million people, and half the voters every four years express unbounded opposition to big business. Yet our advertising charlatans would win them to our way of thinking, fill them with love, make them believe we are set apart and persecuted—different—by a full-page ad with a headline as follows: "We pay $50,000,000 taxes every year." To the beer and pretzel group, this means "Ain't them utility people wonderful!" —nothing more. Again, with trumpets blaring out, we advertise the fact that "We spend $50,000,000 every year for supplies," which reminds thousands of people earning less than $16 a week that at least somebody is making money. Bucket brigades can only react to this show of wealth with mutterings. No wonder they quietly resolve that since the utility makes so much fuss, they will take care of our vanities on next election day.

The utility's advertising sense is like many a trip in the stratosphere. We think we are headed for Peoria, but high above reality as we are, a strong unseen wind carries us back faster than we go forward. Humility is not a matter of good service. It is a matter of friendly, helpful service. And friendliness is never genuine if it must be expressed through boastful advertising.

"But," says the advertising expert, "if we repeat a thing often enough, the public will believe it. Repetition is what forms public opinion." But there never was a more disastrous fallacy. Every utility president who has a sincere desire to win public confidence should lock his advertising expert in the woodshed, and in his place hire at least one good psychologist. If he knows his business, the present advertising quackery will be given a deep and permanent burial.

Repetition of a single thought, contending as it must with multiple impressions in our complex mental and emotional worlds, is at most a hit and miss proposition. If Mr. Public has evidence that the utility is powerful, no amount of newspaper advertising will convince him that it is weak. If he learns by experience that the utility has money to burn, no amount of advertising will make him believe the utility is poor. If experience teaches him that the utility is overbearing, repetition in an ad will not change his opinion. Repetition is valuable only when it coincides with what people want to believe, a truth the politician learned in knee trousers, but which the utility learns never.

Watch the items a politician repeats. The public, he talks about, but not himself save as to what ways he shall serve them. Things the public desires he talks about, and though his promises contradict, and are inconsistent and seem impossible of execution, it is what the public wants to hear and the votes are his. Newspaper ads that attempt to convince a man against his will not only waste

money but serve as a boomerang. They are salt in public wounds that will not heal.

There is one place, however, where advertising can be effective, and that is to announce improved policies, helpful services and operating problems that face the utility. These things are vital and are properly explained in advertising. The public cannot be expected to sympathize with an industry unless it knows the industry's problems. If the situation affects the customer, then the customer will want to know about it. Talk of the present if it is news. Spend much time on the future, and little on the past. But in the meanwhile, watch your advertising men closely. Do not allow them to inject more patent nostrums. See that they get to the roots of the problem at hand in simple, truthful, unadorned language people can understand.

Explaining the company's problems from time to time cannot be left to newspaper advertising alone, however, if public understanding is to be obtained. More effective than advertising is the news story, and, consequently, the publicity man who designs news should be more skillful and resourceful than the engineer. Hire a good publicity man. Feed him well. Surround him with beautiful stenographers, for the inspiration of his messages is invaluable. News stories soar on swift, light wings of credibility, while advertising messages are weighted down with propaganda's stones.

More effective, however, than either the advertising or the publicity story is personal presentation either by sales people, employees, or by the utility man before groups in the humbler sections of every community. Let a utility official with the right personality talk face to face with a group of customers, telling them of the firm's program, its difficulties, its desire to serve, and ill will dissolves like snow in summer weather. The public likes a fighter, and group presentations gives the utility representative an opportunity to deal a knock-out blow to opponents who must sooner or later be discredited. No public utility these days can afford to remain aloof and passive while unscrupulous enemies, playing to class hatred, launch incessant attacks.

The time may come when utilities, seeking public favor, will take more extreme measures to correct operating and service faults. Collections, shut-offs, and other disagreeable functions may be turned over to an outside agency in the plausible name of economy. The transfer of disagreeable duties to someone in business to perform such tasks may eliminate much friction, and no one doubts that daily contact with thousands upon thousands of customers should be made pleasant as possible.

There is no escaping the fact that people in the lower income bracket must be reckoned with and contacted. There is no question that so long as the utility serves them, the cost of service will be greater than the return. It is here that the utility, without waiting for legislative pressure should and can make a friendly gesture, and meet the inevitable half way. Since we are definitely headed toward more and more socialization of industry, why not set up a poor man's schedule and donate off-peak power to the certified poor—provided the city officials or the political party in power furnishes the appliance to use free electricity. A total loss which gains a friend is better than our present partial loss which carries two-fisted, voting energy.

If customers are treated with the respect that is due humans, there is little excuse for the utility as an organization to participate actively in politics. The poor man does not like powerful groups to befuddle his right to vote. Nor does the rich man like it. Experience indicates, however, that the customer welcomes information, unadorned and honestly given, by which he can form opinions. This obligation the utility perhaps owes to the public in matters pertaining to the industry. Anything more must be shunned.

One comment remains to be expressed. It has to do with the personnel of the utility. Often people outside the industry wonder why the electric field has permitted its departments to accumulate so many unfit key employees. If the reason is fear, then let us be unafraid, because these misfits are wrecking us. If the reason is benevolence, a desire to give helpless individuals employment, then let us set a square jaw and shift them to a rear-view window, close to the woodshed in which we have already locked our advertising expert, for they are creating discontent and rebellion in the hearts of loyal employees.

The director of personnel, if he measures up to present-day requirements, must be keenly aware of human nature, kindly enough in sympathies to father and mother those employed by him. He should recognize an employee's worth, and have power to place that employee where he is best fitted. Maturity and a sufficiently adventuresome life should permit him to listen with sympathetic understanding to employee confidence. The personnel manager should be given absolute jurisdiction in any and all departments to carry out a humanizing, public-employee relations program. It is the employee who has the last word, who carries an unhappy, disgruntled mood to the public with authority, and his word far outweighs anything the company may say. Make every employee responsible for fifty friendly customers, and the industry's troubles will practically end. They will serve as a shelter in any storm.

In conclusion, may we repeat that the greatest need on the part of utilities in establishing better public relations is humility. Use the big stick if necessary to obtain it. The world is in revolution, class against class. Let us take a lesson from the prosperous and successful chain stores, which have long since discerned that the public does not covet that which it cannot see. Select humble employees, humble quarters. Then the utility, ending its role of a powerful, condescending, wealthy benefactor, will visualize itself a friendly, helpful, and entirely unimportant personality. It will recognize the customer as a human of great importance, and show this attitude by the innovation of numerous service courtesies. Even the salesman must, as some few utilities are already doing, become ambassadors of good will.

And finally, select those key employees with agreeable personalities, who are fitted to fill the contact jobs needing to be done. The right president has already cleared the ship of troubled waters. Now establish contact with a capable psychologist, and let him check everyday practice against human nature. Second, hire a good publicity man who can keep the name of the company in columns of the press. Third, select a mature man to serve as personnel manager, and offer prayers in his behalf. And fourth, after all these things are accomplished, after service faults are corrected, after the storm clouds are rolled back, and the sun is shining and the sea is calm, open the woodshed door and let out your advertising expert. He is needed now. For if there are merchandise sales to be made, revenues to be built by increased load, he will lead the way.

Partnership of Utility and Retailer

By C. E. Greenwood
Commercial Director, Edison Electric Institute

PERIODICALLY one reads an announcement by a utility company of a change in its policy and practices in connection with the sale of electrical equipment. The utility that has been selling direct may "go out of the merchandising business" as the change is popularly expressed. If interpreted in terms 98 2/3 per cent pure, it might be said that "the utility will continue to advertise and promote household equipment, perhaps finance sales for consumers or arrange it between retailer and bank; and will use its commercial representatives to generate new business but the sales transactions will clear through the retailer."

Now in explanation of this interpretation let it not be construed that all dealers are unable to stand on their own feet in selling. But who will deny that the promotion and sale of electrical household equipment is fraught with pitfalls and there are hills and valleys in the earnings of those retailers that sell electric equipment only. One can find emblazoned on the scroll few names of those who have retired on the profits of a retail business over a five or ten-year period.

Even the most expert in the field of merchandising—the department store merchant—has found that he cannot depend on stable profits for the electric end of his business. The report of the operating results of department and specialty stores recently released by the Controllers' Congress of National Retail Dry Goods Assn. is revealing on this subject. Sales of mechanical refrigerators among this group brought a gross margin of 28.9 per cent, the highest in recent years. Stock turn-over on refrigerators was 6.8 times in 1940 as compared with 4.5 times in 1939. However, there was a loss in operation of 5.4 per cent which was lower than 1939 when it was as high as 8.6 per cent.

A gross margin of 31.7 per cent in appliance departments outside of automatic refrigeration was not enough, with other increased expenses, to yield a profit for department store sales. Gross was up 6 per cent in 1940 above 1939 but there was a loss on major appliances outside of refrigerators of 4.3 per cent.

Over a term of years there has been an attempt to analyze the failure of profit in so many dealer establishments of all trades. One reason given is the "cut price" bugaboo, not caused by utilities selling in competition which was a pet peeve of the merchants several years ago, but through competition between dealers themselves in the independent trades.

I reviewed with interest a recent editorial bearing on this theme by the editor of *Electrical Merchandising*. I would disagree with the premises taken in that article. It is again the question of whether the hen or the egg came first. I do not believe that dealers really want to cut price, but it has been made a part of the department store's policy for so many years that the public has been educated to make best buying response to the "cut price" incentive. Women purchasers in particular expect a reduction. To one that does not agree to this statement I would commend the pages of the daily newspapers. Eyes are attracted to "reduced," "formerly," "regular value" and such stimulating stuff. Also note the crowds at opening time storming all entrances of a reputable retailer who has advertised some popular item at sharp reduction; or better still, try to reach the counter in the midst of one of these sales. It is in the shopper's blood. It is a psychological problem, and it is in such times that are ahead, when the dealer is through the present hey-day of a seller's market and when the survival of the stronger economically only can stem the tide, that an attempt can be made to return to first principles.

It will require "dealer sales training." It may be pertinent to refer here to the new series of ten sound-slide films directed to the selling of kitchen equipment in particular, and produced by the Modern Kitchen Bureau, which should be popular sellers. The electrical dealer who is to be developed to profitably distribute electrical merchandise needs more sales and business training and less coddling.

In an attempt to obtain a viewpoint from the utility field on the ever important local situations in utility-dealer promotion and distribution of household electrical equipment, a committee of Edison Electric Institute concerned with this subject surveyed by questionnaire, and presented a conclusion on facts presented. One hundred forty-six companies replied, 120 of which sell some appliances direct. Of this group of 120, there are 76 selling a complete line and 44 a partial line. Only 24 companies "out of the merchandising business" replied.

A summary of results follows:

A. Methods employed by both merchandisers and non-merchandisers to assist dealers.

1. Cooperative advertising	77
2. Special campaigns	50
3. Home service help	39
4. Financing deferred payments	36
5. Educational help for dealers' personnel	36
6. Display assistance	30
7. Installation allowances	28

B. Methods employed by merchandisers only to assist dealers

1. Trade-in allowances	10
2. Allow dealers to sell from company floors	8
3. Wholesale to dealers	6

C. Methods employed by non-merchandisers only to assist dealers

1. Furnish leads and prospects	6
2. Supervisory assistance	4
3. Dealer bonus plan	3

D. Does all dealer selling plan, without Utility merchandising, produce greatest increase in energy sales per resident?

Yes	12
No	110
Doubtful	6
No answer	18

The summary of the Committee points out that, in general, it is apparent that reporting companies are satisfied that the policy under which they operate is the most effective under local conditions. There is no evidence of indecision, nor any trend in immediate change of policy indicated.

Methods employed most frequently by both merchandisers and non-merchandisers to assist the dealer to become a more effective outlet for electric appliances are noteworthy because they appear to be identical. It is evident that regardless of whether or not a utility engages directly in merchandising, in practically

(*Continued on page* 352)

McGraw prize paper

Combustion Analysis in the Modern Boiler Unit

By H. B. Lammers and E. B. Woodruff

MR. WOODRUFF

Mr. Lammers and Mr. Woodruff are the joint winners of the Second James H. McGraw Prize for 1941.

Mr. Woodruff started as a clerk with the Cincinnati Gas and Electric Company in 1921. At present he is plant engineer of the Columbia Power Station, largest of this company's two generating stations. He was graduated from Ohio Mechanics Institute and has been a teacher of night classes there since 1921. Mr. Woodruff has also attended University of Cincinnati evening college, studying general engineering and mathematics.

Mr. Lammers is a graduate of Xavier University, Cincinnati, and attended University of Cincinnati evening engineering college. He started work with the Cincinnati Gas and Electric Company in 1925 and was Test Engineer at the Columbia Power Station. He left in April of this year to become power supervisor of the Wright Aeronautical Corporation's new airplane engine plant at Lockland, Ohio. At the Ohio Mechanics Institute evening school he has been an instructor for the past ten years in stationary engineering, engineering laboratory and mathematics.

Mr. Woodruff and Mr. Lammers are co-authors of a text book, "Steam Plant Operation," published by the McGraw Hill Publishing Co.

MR. LAMMERS

ONE morning as the Chief Engineer approached his plant he was appalled to see black smoke coming from the stack. The "stack cleared" before the chief reached the plant. He had seen enough to indicate that all was not well and decided to investigate. The boiler from which the gases discharge to this stack had only recently been put in service. It was modern in design and equipped with the usual instruments and controls to guide and assist the operators.

A study of the recording charts and the statement of the operators failed to reveal the real cause. The carbon dioxide recorder chart showed an increase of one-half of one per cent some time after the reported smoking. The combustion engineer assured the chief that this was not sufficient increase to cause the unit to smoke. A recheck of instruments and controls with the boiler operating at constant rating showed all instruments and equipment to be in proper adjustment.

The morning on which the chief noticed the smoking, the load had been picking up rapidly. It was found that smoking occurred during rapid changes in load. The discharge of smoke was of short duration and the boiler instruments, even the orsat analysis, failed to indicate serious errors in combustion conditions. It was evident that the problem required an entirely different method of approach.

The fundamentals of combustion are well established and understood by those engaged in the operation of modern boiler units. The present application of these fundamentals is the result of development from smaller and simpler equipment. Although this form of development is typical and desirable in all forms of engineering progress, it has at least one very outstanding disadvantage. Thinking and judgment is so influenced by past practices that we fail to apply the well known fundamentals to the new condition.

You discuss the combustion problems in a modern pulverized fuel plant with engineer friend Mr. A. Presently he will attempt to explain his point of view by relating the condition in the plant of X-Company, where he worked several years ago. Later in the conversation you find that the plant referred to contained single retort underfeed stokers and operated at almost constant rating. The only similarity between this plant and a modern pulverized fuel plant lay in the fact that the fundamental requirements are identical. However, the approaches toward meeting these requirements are restricted by entirely different limitations.

When the change in application is so drastic, as is the case where a high rating pulverized fuel unit is compared to a small stoker, it is more logical to apply the fundamentals directly to the individual case. The old axiom "experience is the best teacher" still holds, but one must be cautious since the practical experience may not apply to the case at hand. In these instances we might rely upon known fundamental conceptions.

Regardless of the particular equipment and physical procedure, there are but four factors which influence combustion:

(1) The air supply must be sufficient to provide the required oxygen.
(2) The fuel and air must be thoroughly mixed.
(3) The duration of time that the mixture of fuel and air are held at the elevated temperature.
(4) The temperature of the fuel and air during and after mixing with the fuel.

All combustion equipment attempts to control these four physical factors. It follows that all combustion processes may be analyzed with respect to the de-

gree by which they meet these requirements.

The proper *proportioning* of *air* to *fuel* has been given due consideration in engineering literature. The theoretical amount of air required for a given fuel is easily calculated when the fuel analysis is known. The amount of air actually required for a given installation depends upon physical and economical limitations and is best determined by experiment. The boiler unit is operated at various loadings and percentage of excess air. Studies are made of the operating conditions, efficiencies and maintenance costs. The limiting factor in reducing the excess air may be:

(1) Excessive unburned fuel losses.
(2) High furnace maintenance owing to high furnace temperatures.
(3) Operating difficulties in form of tube slagging or clinker formation.

From this comprehensive study, the optimum percentage of excess air is determined. The percentage will vary when there is a change in the analysis of the fuel and certainly when there is a different type of fuel used. Then the optimum percentage of excess air will vary with the boiler rating. For example: with refractory walls the excess air is increased when the rating is increased. When water wall units with slag type furnaces are employed, the excess air may be decreased as the rating is increased.

Formerly the excess air decided upon was between twenty-five and fifty per cent and a deviation from this value for a short period of time was not considered serious. When the load on a boiler unit was fluctuating we did not expect the fireman to maintain the excess air at the exact amount.

There has been a continuous development of instruments and guides from the time that sole reliance was placed on the judgment of the fireman. Today the refinements of boilers and furnaces have reduced the required amount of excess air. A small deviation from the proper condition results in a deficiency of air sufficient to cause smoke. We are now demanding very close combustion control even with wide fluctuations in load. To proportion fuel and air when the load is steady and when it is fluctuating to fifty per cent of the boiler capacity every few minutes, is an entirely different story.

The second important factor in the combustion process is the *mixing* of air and fuel. Combustion equipment designers and operators have always recognized this factor. There is, however, a great difference between coal moving down through the retort of an underfeed stoker and a speck of coal moving in a pulverized fuel furnace. Better mixing is one of the advantages claimed for pulverized fuel. Combustion takes place on the surface of a solid fuel. Other conditions remaining the same, combustion is improved by increasing the surface per unit of volume. An inch cube of coal has six square inches of surface to come in contact with oxygen. If this cube is cut in two parts it will have eight instead of six square inches of surface. When pulverized ready to burn, this cubic inch of coal would have approximately 500 square inches of surface.

With this enormous surface exposed for oxidation the next step is to see that the air and small coal particles are thoroughly mixed. Present burners are a great improvement over those formerly used. The primary air and coal are thoroughly mixed and the secondary air is added at the point where the fuel enters the furnace. The turbulence assures mixing and a fairly uniform supply of oxygen to each particle of fuel. A less favorable condition prevails when the unit is operated at reduced rating with only part of the burners in service.

Very closely related to the mixing of fuel and air is the *time* during which this mixture remains at high temperature. The advantage obtained by the enormous increase in surface area resulting from pulverizing coal is partly lost by the short duration of time that the coal remains in the furnace. In a high rating unit it may require but three-quarters of a second for the fuel to pass from the burner tip through the furnace to the convection surfaces. When one considers this short time in which combustion must be completed it is easy to see why air and fuel must be so accurately proportioned. This short combustion time is a disadvantage inherent in the modern high heat release units. This disadvantage is relative to other combustion conditions and its effect upon final results is minimized by proper air-fuel ratio, thorough mixing, and high temperatures.

The other important factor is the *temperature* maintained during the combustion process. Well known is the fact that the fuel must be above some temperature known as the kindling point. There is a difference of opinion as to the effect of extremely high temperatures. When boilers equipped with water cooled furnaces are operated at low ratings the furnace temperature is low and the carbon loss in the fly ash is high. Combustion is retarded by the low temperatures resulting from heat absorption by the furnace walls. With this type of installation it is frequently necessary to increase the excess air as the rating is reduced in order to compensate for low temperature and poor mixing. From this we see that the four factors which influence combustion are inter-related. Furnace temperature is controlled either by changing the percentage of excess air or by adjusting the amount of heat absorbing surface which receives radiant heat from the furnace.

From these considerations it is evident that the proportioning of air to fuel is an important factor in the combustion process. In modern boilers, low percentages of excess air and fluctuating loads increase the necessity for accurate regulation. Because of these requirements, present combustion instruments have certain shortcomings.

When the carbon dioxide analyzer is used to determine combustion conditions we are confronted with two difficulties. First is the question of locating the sampling tube so that the gas sample will be representative. This becomes a very serious problem when burners are taken in and out of service to regulate the boiler output. Then there is the time delay between the combustion process and the time the instrument records or indicates the results. The combustion of coal in a pulverized fuel furnace is a matter of seconds, so that the unit may produce smoke long before improper combustion conditions are indicated by the instrument. In addition to time lag, many carbon dioxide recorders do not indicate the maximum and minimum values but give an average which is not indicative of actual conditions.

Manufacturers of carbon dioxide recorders have been making progress in producing instruments with less time lag. One company advocates the use of an oxygen recorder to analize combustion conditions by determining the excess of free oxygen in the flue gases. This instrument reduces the time lag to five seconds, but the problem of securing an average sample still remains.

Another method of indicating combustion conditions is to compare the differential, caused by the flow of gases through a section of the boiler, to the steam flow from the boiler. In a given boiler the steam flow is proportioned to and may be used as a measure of the

heat input. It has been proven that for a wide range in fuel analysis the air required is proportional to the heat content. The flow of gases can be measured by the differential draft drop across a section of a boiler in much the same manner as a flow meter measures steam. It follows that the steam flow is a function of the fuel used, and the pressure drop across the boiler pass is a function of the air supplied to the unit. When properly calibrated this steam-air flow instrument may be used as a combustion guide. The calibration is such that when the steam flow and air flow indication coincides, optimum combustion conditions are obtained.

This instrument indicates changes in air flow almost instantaneously. The operator is able to see the effect of control adjustments without delay. Since the measurement element for the air flow consists of draft taps into the setting, a desirable averaging effect is obtained. Even when there is stratification owing to operation with only part of the burners, this instrument will indicate *average* percentage of excess air with remarkable accuracy.

When the boiler output is changing rapidly, it is *not desirable* to have the steam flow and air flow indicators coincide. When the boiler output is increasing rapidly, fuel is being burned at a rate in excess of what would normally be required for the instantaneous output. When the air flow-steam flow relation is maintained under these conditions there will be a decrease in the percentage of excess air. In a similar manner if the load is decreasing and the air flow-steam flow relation is maintained, there will be an increase in the percentage of excess air. From this we see that when the load is changing, the air flow indication must precede the steam.

Whether the boiler unit is regulated by hand or by automatic combustion control, the fundamental problem remains the same.

Since the advent of the modern high capacity boiler unit, interest in combustion has greatly increased. Larger units with smaller furnaces, complete water cooling, automatic controls and other modern refinements have done much to complicate the combustion problem. Analysis of combustion in the *average* furnace is difficult unless extreme care is employed in the procedure; in the modern furnace the task is complicated still further by the divided pass for superheat control.

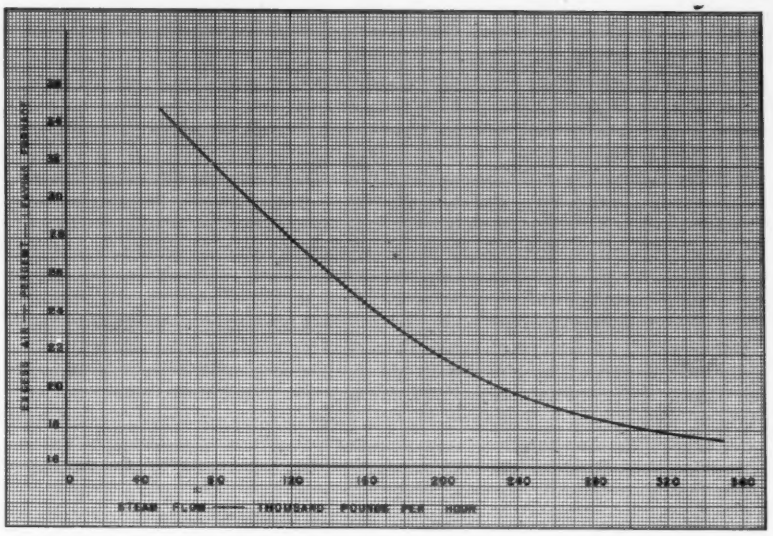


Fig. 1—Calibration of Steam Flow-Air Flow Meter.

In order to analyze some of the difficulties normally encountered, tests were run on a large modern water tube boiler unit. This unit is equipped with water walls, screen tubes, superheater, economizer and preheater with a combined capacity of 350,000 pounds of steam per hour. This unit has a divided pass section for superheat control. A slag tap is provided for continual removal of the slag. The unit system of pulverization is employed with four burners located across the roof of the furnace.

Fuel is supplied to the pulverizer mills by mill feeders. The feeder controllers operate with an "on" and "off" cycle to hold a constant mill fuel level.

The boiler is equipped with automatic combustion and feed water controls.

Instruments used on this test consisted of steam-air flow meters, carbon dioxide and oxygen recorders.

Flue Gas Analysis

In analyzing combustion conditions one is confronted with the following questions: What methods of procedure are available for analyzing combustion conditions? What instruments should be used? By what method and from what location should the analysis be secured?

The Orsat Analyzer is usually employed where accuracy is desired. For continuous recording, carbon dioxide and oxygen analyzers are often used.

Regardless of what type instrument is used, testing with an Orsat is the usual method for checking the accuracy and is consequently relied on to a considerable extent. Extreme accuracy is possible with this instrument if it is used properly.

The sampling location for purposes of analysis is of the utmost importance. The analysis should be as complete as possible if accuracy is desired. However the many conflicting points must be given serious consideration.

The sample must be secured or taken from a zone of high velocity gas and at a point where combustion is considered to be complete.

If the sampling location chosen is close to the furnace, combustion may not have been completed. High furnace temperatures make water cooled sampling pipes necessary.

If the sampling location is in the boiler uptake, preheater, or suction to the fan, combustion should be complete and water cooled sampling pipes will not be necessary. However, air leakage (infiltration) and the fact that the sampling point is far removed from the combustion process tend to make the sample less valuable.

Spot Sampling & Speed

When the boiler is of considerable width, a spot sample has little significance and is of very little practical value for maintaining fuel-air ratios. Many studies have been made in an effort to determine the locations considered suitable for securing *average* samples.

Assuming the location *is* found to be suitable, the next question is whether or not the analyzer is sufficiently fast to permit a thorough study of conditions prevalent in the modern furnace. When

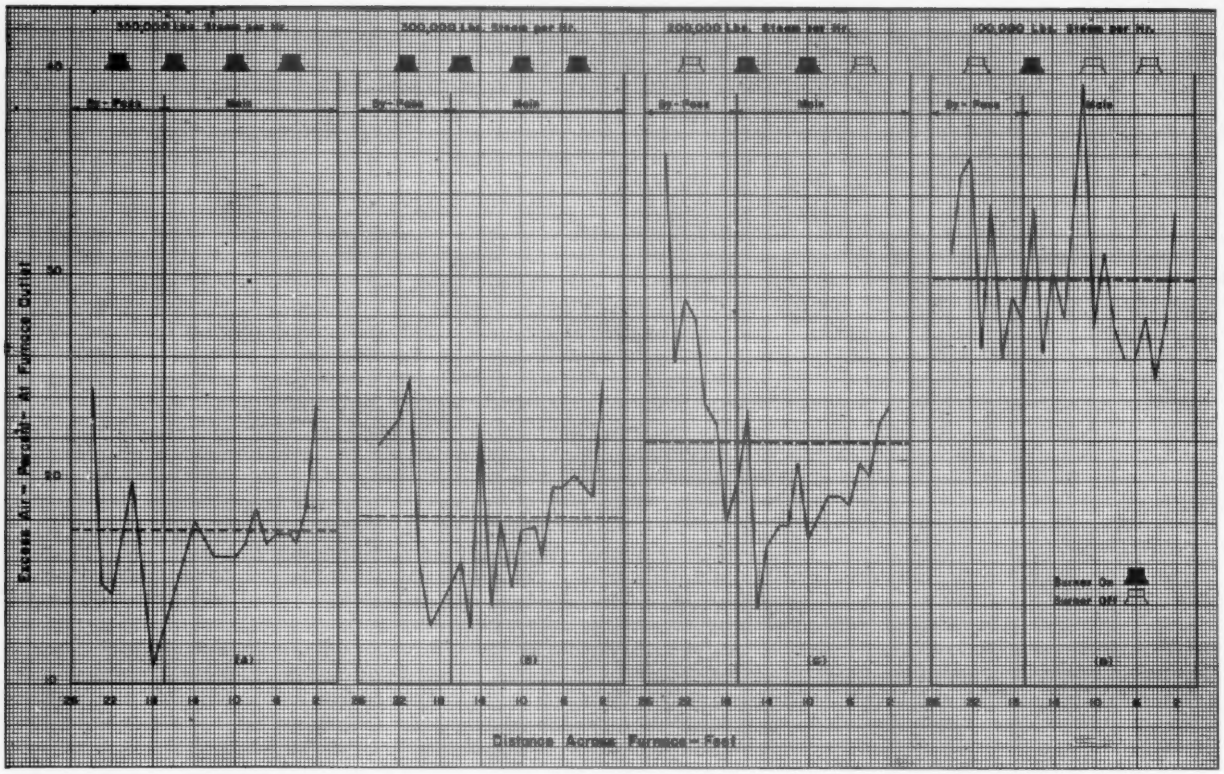


Fig. 2—Calibration of Steam Flow-Air Flow Meter by Spot Sampling at Furnace Outlet.

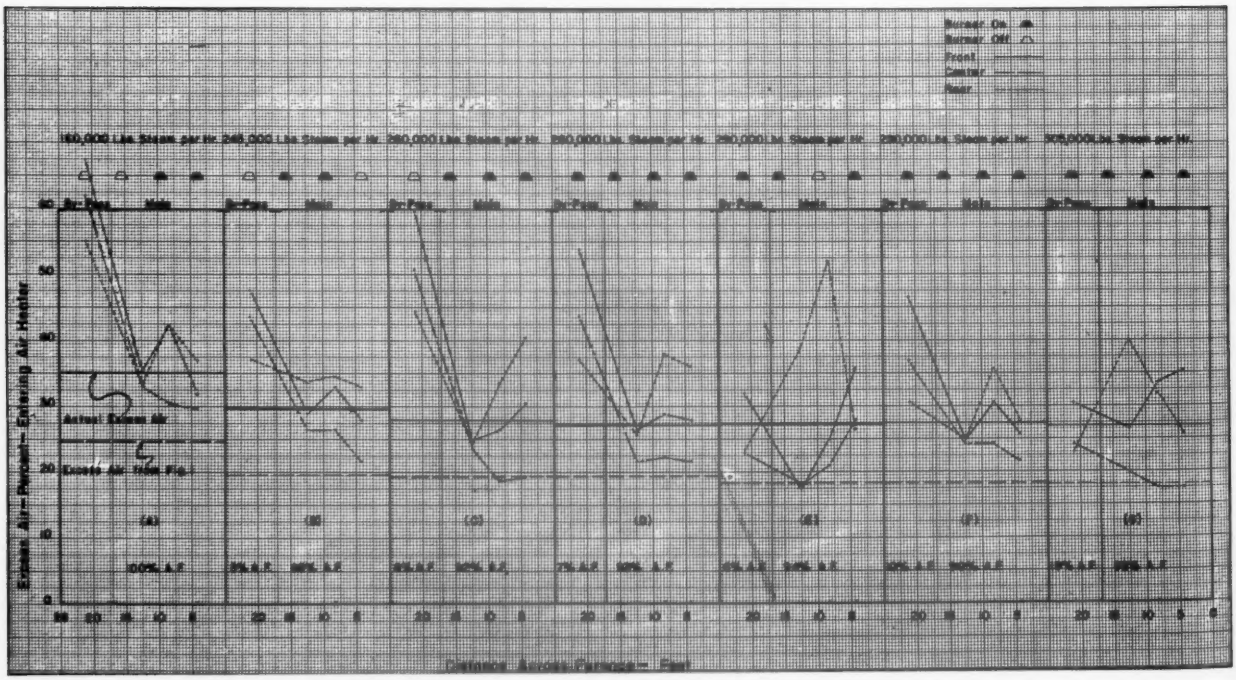


Fig. 3—Variations of Excess Air Across Air Heater Inlet Under Various Ratings, Burner, and Damper Combination.

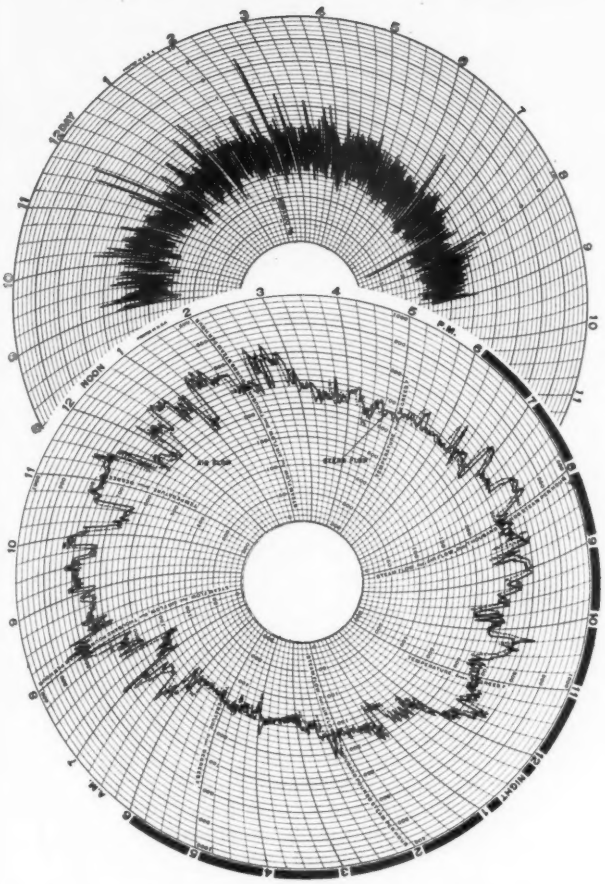


Fig. 4—Daily Operation—Comparison of Steam Flow-Air Flow and Oxygen Record.

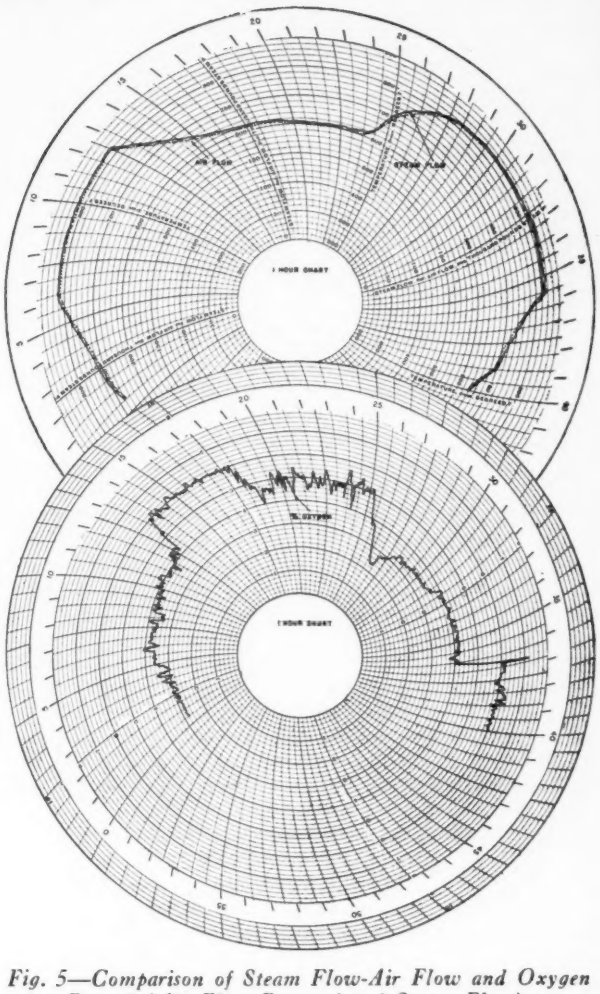


Fig. 5—Comparison of Steam Flow-Air Flow and Oxygen Record (Air Flow Proportioned Steam Flow).

the analysis is made with an Orsat, at best, the sample is intermittent. When made with a carbon dioxide recorder, the analysis is neither complete nor fast enough. A time lag of one to three minutes is normal. If the analyzer is at some distance removed from the point of sampling, as much as ten minutes time lag is frequently introduced.

Carbon dioxide recorders may be considered a guide, but never as an index of combustion, even though the sampling location be considered satisfactory. Where accuracy is desired other methods of analysis must be employed.

Combustion conditions are studied for the purpose of eliminating difficulties in the equipment or control mechanism. This analysis can be made (1) at steady rating to determine the excess air and resulting conditions desired, (2) with fluctuating loads, to analyze the performance with quick changes in load, eliminate smoke, make the unit respond faster and improve the efficiency.

Where spot sampling is resorted to, the questions frequently asked are: "How accurate is the sample?" "How is the sample affected by stratification?"

Excess Air Vs. Rating

The steam-air flow meter is calibrated by making a traverse of the pass through which the gases pass at high velocity before they enter the convection surfaces. This procedure reduces the inaccuracy of spot sampling.

Previous tests have shown that a unit of this type operates best with a variable percentage of excess air. The desirable excess at various ratings is shown in Fig. 1. This relationship (excess air desired) has been determined giving consideration to combustion losses, effect of water cooling, combustible in the fly ash, slag removal, etc.

The limiting factors are:

Low Ratings—loss due to unburned carbon in the fly ash.

High Ratings—loss due to carbon monoxide (CO).

In order to hold the efficiency at a maximum, the excess air must necessarily be held at the desired value.

The excess air desired as shown in Fig. 1 is the average of the large number of spot samples (Fig. 2) taken across the inlet to the convection pass. Analysis is made at every foot commencing two feet from the side wall and extending across the width of the furnace. The dotted line shows the "average" analysis across the pass and corresponds to the desired setting as shown in Fig. 1. These spot sample "averages" are considered suitable for setting the steam-air flow meter. However it is apparent that no *one* position could be taken or chosen to secure a sample that would approach the "average" for all prevailing conditions.

From these averages, the steam-air flow meter is calibrated.

Analysis across the pass is made at steady rating with an Orsat: that is

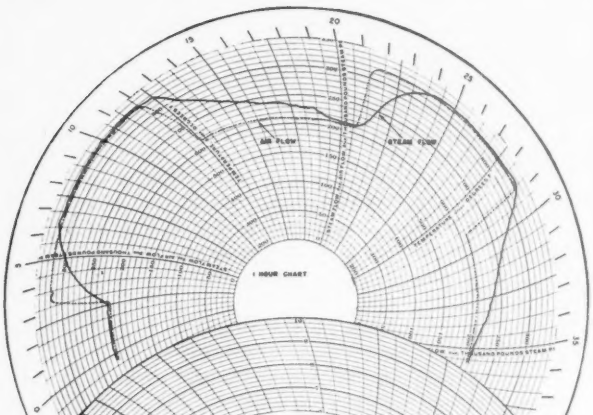


Fig. 6—Comparison of Steam Flow-Air Flow and Oxygen Record (Air Flow Proportional to Fuel).

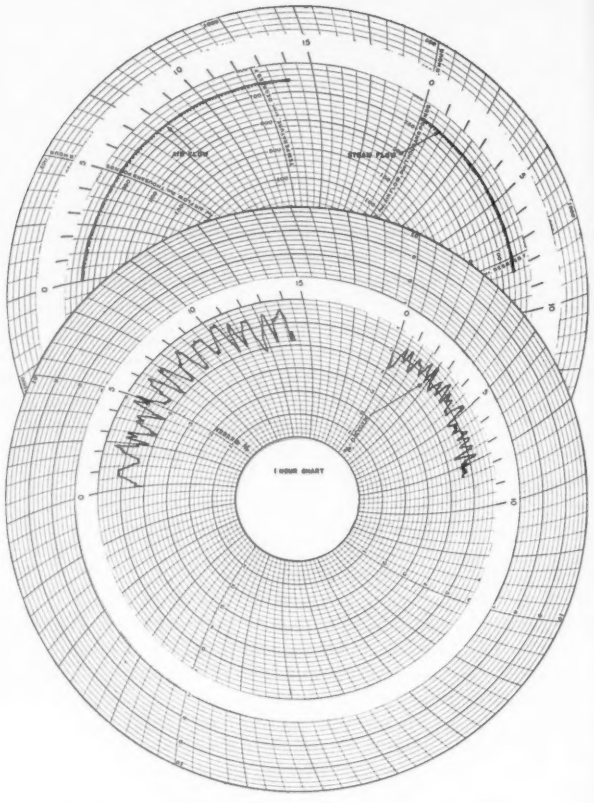


Fig. 7—Comparison of Steam Flow-Air Flow and Oxygen Record Before and After Shortening the Period of the Feeder Controller Cycle.

holding the steam and air flow pens together to eliminate as many of the variable factors as possible.

The heavy line under burner number three is the by-pass baffle which is used to regulate the superheat temperature. This baffle is located beyond this point and is referred to for convenience in studying combustion conditions.

In Fig. 2 the rating varies from 350,000 to 100,000 pounds of steam per hour. The extent of stratification is readily apparent.

Stratification

The stratification present is seen in Fig. 2 (a) to (d) and shows the disadvantage of "spot" sampling. Even though the analysis is irregular across the pass, nevertheless the average checks the desired excess in Fig. 1.

Observe the decided difference between the "spot sample" curves at the various ratings.

What representative "spot" sample could possibly be chosen for accurate analysis?

The average results shown in Fig. 2 are used to reproduce the calibration of the meter for the desired excess shown in Fig. 1.

Naturally the question arises: How well can the air flow meter be made to follow this curve?

The degree of accuracy possible is shown in Fig. 3. Twelve sampling points are located at the entrance to the air heater and nine are located in the main section of the boiler, while three are located in the by-pass section. All points are arranged so as to secure samples from equal areas.

The horizontal heavy line is the average of the twelve readings taken across the uptake. The "average" is proportioned for the percentage of air through the main and by-pass section and is not an arithmetical average

The dotted line is the desired excess leaving the furnace for which the meter air flow is set from Fig. 1.

Different ratings and various burner combinations are shown. What "spot sample" could have been selected as representative for the entire group here? Making allowance for the amount of air infiltration, the excess is constant even though the samples fluctuate considerably.

Therefore regardless of the accuracy of the Carbon Dioxide and Oxygen analyzer, it is difficult to see how *any* spot sample could approach the accuracy of the steam flow-air flow meter. The accuracy with which the meter retains the average excess desired is remarkable and readily apparent. It shows how accurate the air flow meter can be made to operate if carefully calibrated.

Effect of Time

Factors which influence combustion are Time, Mixture, Air and Temperature.

In a modern furnace employing automatic control, large quantities of fuel are burned in a given time. Hence the time element is an important one where analysis is concerned. When changes in

load are made almost instantaneously the fuel and air must be varied in correct proportions to approach perfect combustion. Hence the importance of time cannot be over-emphasized if combustion conditions are to be properly synchronized with operating performance and correlated with the control equipment. In most cases the time allotted to combustion (before the gases enter the convection surfaces) is in the nature of three-quarters to two seconds.

For high speed analysis, the procedure normally had been to use four or five Orsats.

If the problems confronting the combustion engineer are to be solved, the samples drawn must be sufficiently fast and continuous.

Procedure for Analyzing Combustion Conditions

How combustion conditions were analyzed in a modern high rating boiler is explained somewhat in detail.

A location was selected at a point where the gases enter the convection pass. At this point combustion is considered to have been completed and air infiltration has no appreciable effect on the analysis. This location requires a water cooled sampling pipe.

Sampling and analyzing the gas was accomplished by means of an oxygen analyzer and recorder. The feature of the analyzer is the speed with which the sample is secured as the time lag is only in the nature of five seconds.

A daily operating record of the steam-air flow and oxygen chart is shown in Fig. 4. It is apparent that the fluctuations shown by the oxygen recorder are entirely too rapid and the excess air (oxygen) is not very steady. (As a matter of fact, these fluctuations are so rapid that they are not even reflected on a carbon dioxide recorder.) It is apparent that variations in oxygen reflect disturbances in the furnace but that the movement of the pen on the chart is so rapid that it is difficult to determine the cause. It is evident that the combustion process is not proceeding as it should.

With the normal chart shown in Fig. 4, it is impossible to synchronize the operation of the control with the combustion process.

In order to better study the combustion conditions a "fast" chart was installed on both steam-air flow meter and oxygen recorder. The speed of the chart is one revolution per hour which then magnifies the record twenty-four times.

Steam—Air Flow Proportioned (Air To Steam)

A comparison of the Steam-Air Flow is shown in Fig. 5 together with the oxygen record with the *air flow proportioned* to the *steam flow*. By proportioning is meant that the combustion control equipment is so operated that the air flow and steam flow records coincide.

On these tests the changes in rating were affected by definitely positioning the fuel for some predetermined change. The time required to produce this change is shown on the fast chart and the change in oxygen content is noticeable. One can see what occurs when steam and air are proportioned and made to coincide during the change.

When the flow is reduced to 210,000 pounds per hour, the oxygen content goes up due to the fact that more air is being supplied than is actually desired. Notice how, when the flow approaches 210,000 pounds per hour, the oxygen (excess air) is gradually being restored to its proper value. This value is slightly *higher* than at the previous rating because the boiler meter *is set* to carry a *variable excess air* (Fig. 1).

When the load is increased, the fuel

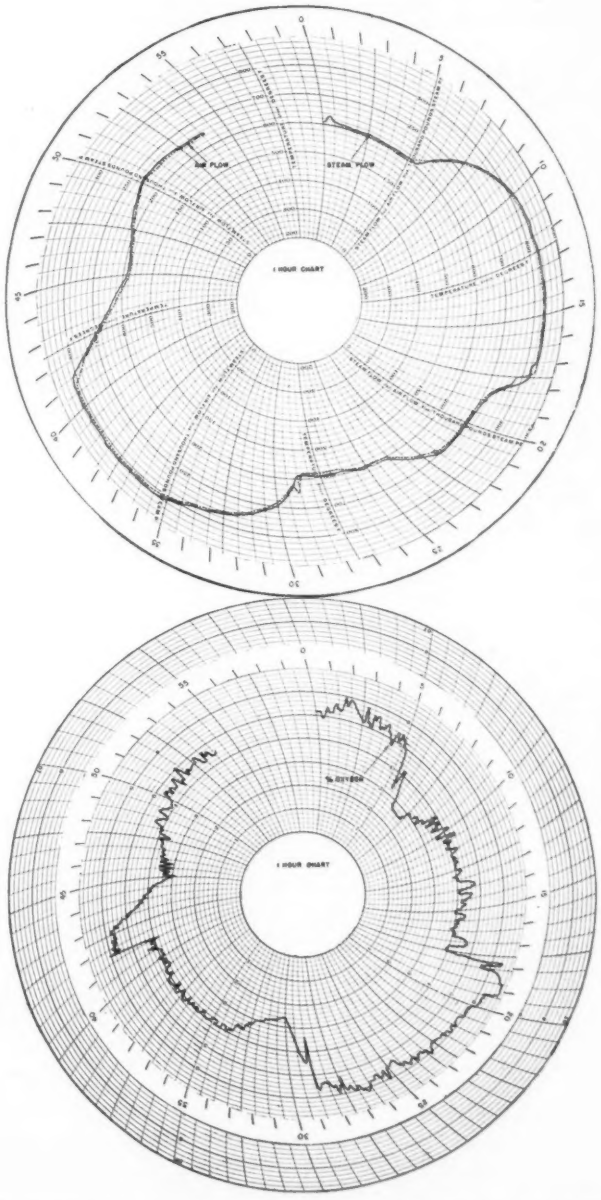


Fig. 8—Comparison of Steam Flow-Air Flow and Oxygen Record After Shortening the Period of the Feeder Controller Cycle.

is supplied very rapidly and the mill level is reduced and for a short period of time we have an excess of fuel (or a deficiency of air or oxygen). When the level is restored the excess air (oxygen) remains low until the definite loading point is reached.

In reality there exists a deficiency of air from the time the rating increase begins until the steam reaches its maximum.

Air & Fuel Proportioned

A comparison of the operation with the steam flow proportioned to fuel is shown in Fig. 6. The combustion control equipment is made to operate so that the air flow coincides with the *fuel* input.

By this is meant that when changes in rating are made, the *air* is *not made to coincide* with the *steam flow* except at time intervals when the fuel input is not being varied (steady rating).

Again the rating was changed by definitely positioning the fuel and air together and simultaneously in the correct proportions. Hence on a load increase, the air is made to immediately position itself for the desired steam flow change.

The relationship between fuel and air can be carefully analyzed and comparison made with the performance in Fig. 5. This improvement is reflected on the oxygen chart record.

On a pickup in load, the air flow precedes the steam flow and reaches the new value ahead of the steam but during the period of change approximately the correct amount of air is provided.

The "peaks" on the oxygen chart are present because the fuel is supplied in *excess* for short periods when the load is picked up and a *deficiency* exists when the load is dropped off. This unbalance is brought about because quick changes cause the mill level to vary above or below the normal level for short periods of time.

Speed of Feeder Controller

The above discussion explains the cause of variations in the oxygen record when the load is changing but does not account for the variations when the rating is constant.

A comparison of steam-air flow and oxygen record before and after shortening the period of the feeder controller cycle is shown in Fig. 7.

This fuel feeder controller operates with an "on" and "off" cycle. In the first case the speed of the cycle was approximately half the speed in the latter case, both in the nature of seconds. The improvement in the chart is very noticeable; the last record was considered to be satisfactory operation.

Hence the difficulty encountered with variations in oxygen (Fig. 4) (for control fuel feed) has been eliminated by changing the speed of the feeder cycle. The analysis of this condition was made possible by the high speed chart.

After adjusting the speed of the fuel feeder controller, the comparison of steam-air flow and oxygen chart are shown in Fig. 8.

The steam and air flow are proportioned with the air *coinciding* with the *steam* flow.

Note the improvement in oxygen record. However the deficiency of air on an increase in rating is probably more apparent than on previous charts. The length of time required to restore this is the entire interval of time required to accomplish the load increase. Likewise when the load is dropped, an excess of air or deficiency always exists on the boiler when the steam and air are made to *coincide*.

If the change in rating is compared with the oxygen chart, it is apparent that the final "desired value" of oxygen is only in agreement when the steam-air flow reaches its maximum or minimum.

Conclusion

Spot sampling is unreliable as a guide for combustion control where accuracy is desired in maintaining fuel-air ratios and eliminating smoke.

Oxygen (O_2) recorders, operating from spot samples are not accurate for indicating combustion conditions. Many records have too much time lag for controlling combustion conditions when boilers are operating with fluctuating loads.

Stratification exists and varies with burner combinations. The only accurate method of securing a true analysis is by making a traverse across the width of the boiler.

High speed charts not only make possible a more accurate analysis of the combustion conditions but also enable one to synchronize records with the equipment performance.

High speed charts offer a means of studying the effect of various factors involved in automatic combustion control.

Better Light-Better Sight Bureau Offers New Program

THE most complete lighting promotional campaign ever offered by the National Better Light-Better Sight Bureau is rapidly nearing completion, with several promotional aids already set to sell and the others to be ready shortly. A talking motion picture in full color, three sound-slide films on residential, commercial and industrial lighting, four animated window and counter displays, three consumer booklets, 20 newspaper advertisements, two reader article clip sheets, direct mail pieces and other sales aids make up the campaign.

A new technique in lighting promotion and sales will be used in these materials. Proper blending of the educational theme, to show *why* Better Light is required for eye comfort and safety, and the sales appeal, to show *how* I.E.S. lamps, adaptors and other lighting equipment perform this task, will be used throughout and is expected to prove highly effective in making lasting sales through increased customer knowledge of benefits received from Better Light.

The talking motion picture brings showmanship to the utility company's promotion, with this latest and most effective way to reach mass audiences. Aimed primarily at the upper classes in all schools, this full color picture is equally impressive for adult audiences, clubs, parent-teacher groups and societies. Designed for the 16 mm. projectors to be found in nearly every school today, the picture will be good for many showings to thousands of customers.

The sound-slide films, on residential, commercial and industrial lighting, are designed for dramatic presentations to groups of those customers primarily concerned with each type of lighting. Each will last 15 minutes. Thirty of the 95 frames in each picture will be available in full color if desired.

(Continued on page 364)

"If Mammy Trots and Daddy Trots the Colt Won't Pace"

A Load Dispatcher's Pertinent Observations on Dollars and Sense

By Jess Paschall
Portland General Electric Company

DOMESTIC consumers in the United States used approximately 5,000,000,000 kwhr of electricity in 1922, for which they paid an average price of 7.38 cents per kwhr. In 1939 this consumption had risen to almost 20,000,000,000 kwhr, while the unit cost dropped slightly over four cents. Otherwise, the housewife who paid $7.38 for 100 kwhr in 1922 paid only $4.00 for it in 1939. In addition to receiving a reduction of almost 50 per cent in this item of household expense, the housewife also found a service in 1939 hardly comparable to that of 1922. The cold facts of this excellent record refute some of the false charges that have been made against the electric utility industry. It seems rather strange that the industry that has brought so much comfort and happiness to American homes, farms and factories, should today find itself somewhat ill at ease with the people it serves.

Some of the reasons for this existing condition are political but there are other reasons too and we shall not go into them here, since it is the purpose of this paper to deal with the subject of employee economy in operation and maintenance. The average citizen seems to think only of the power company as being a large, cold-hearted corporation with a few high salaried executives who attend Chamber of Commerce luncheons and belong to some swanky private club where they drink Scotch highballs and discuss the stock markets.

The mere fact that the power company has more than 100,000 accounts on its books is sufficient to cause the small storekeeper to regard it as something sinister. He knows nothing about the cost of rendering electric service and what is more, he cares nothing about it. He is concerned only with what it *costs* him and the *quality* of the service. This is more or less true of you and me, with respect to the corner groceryman's business. We are concerned only with the price we pay for potatoes and their quality. The small business man has at least one advantage over the power company serving him. He can personally watch over the daily expenses of running his business, while the president of the power company must depend upon an army of men and women to do this job for him. The president of the power company might be a better engineer than the man he has supervising the installation of a substation, but he cannot very well watch the spending of every dollar that goes into it from within the office where he carries on the executive work. He must depend upon the person in whom he has placed a certain amount of confidence and trust to do this for him.

The reward for a job well done rests in the satisfaction of knowing that it has been well done. And, a little common horse sense will often save dollars doing it. The job foreman who has the company's best interest at heart likewise has that of his own, as well as that of his men, at heart. For indeed WE are the company and what hurts the company hurts us and what helps the company helps us. Those of us who hold supervisory positions have a certain responsibilty to the men who work under us. We should remember that old saying, "If mammy trots and daddy trots the colt won't pace." We set the example for our men in economy, efficiency and safety. Either one of which can save or waste money for the company and at the same time create a good or bad impression on the men working under us. Accidents are costly in both money and misery. We know because we were on the receiving end of one once. The job foreman can do much to prevent accidents. He must be the "seeing eye" of his men. Nothing can be more helpful to the workmen than to have good examples set for them, by the foreman, in efficiency, safety and economy on the job. It is like going to school and getting paid for it. The "yardstick" of any business enterprise is its *overhead*.

When the *overhead* exceeds the *income* look out—bankruptcy is just around the corner.

Probably no other supervisor is in a better position to save or waste money for the power company than its "System Operator" or "Load Dispatcher." This man has complete charge of generation, transmission and distribution, in so far as it affects the customer's service. No piece of generating equipment, rolling or stationary, can be put into or taken out of service without his approval. He is on duty 24 hours every day in every year, and while the customer may not have heard of him, he has more to do with the customer's service than any other individual in the organization. Should he care to do so, he could, within one minute, shut off service to every single customer on the system; but he had better have good reasons for doing this should he ever get such an idea in his head. During the 15 years the writer has been dispatching energy, he has never found it necessary to order a complete blackout—and we hope never to.

The fellow in the Accounting Department can make a mistake with his figures and, save for loss of time looking for the error, the cost to the company will be negligible, but let the load dispatcher make a mistake and it usually costs the company sometimes up into the thousands of dollars. A slight slip of his slide rule, in figuring the flow of water in the rivers from which comes hydroelectric power, and he can burn money in the fireboxes of a steam plant as a result. He directs and supervises intercompany ties for the purpose of selling or purchasing of energy, as the case may be, and is responsible for the execution of contracts covering same, which often provide a penalty for in-

fraction of some certain clause. Whenever serious trouble occurs on the high-tension network and several hundred workmen in some large industrial plant have become idle, due to a power failure, the load dispatcher can delay the restoration of service and cost the customer money in the loss of man-hours and his company will suffer a loss in kilowatt-hours that can never be recovered. The customer can call the president of the power company and complain of his service being off, but the president will be helpless to do very much about it. Only the load dispatcher can restore the service. He is not only responsible for the customer's service, but he is equally responsible for the lives of the men who shin up slick poles to make repairs and maintain service. When the customer wakes up in the morning and looks at his electric clock, little does he realize that the load dispatcher has kept a close watch over this accurate little timepiece throughout the night and kept it in almost perfect unison with Western Union time. From his office go private telephone lines to all stations and substations on the system, as well as to every major department, and it is over these phone lines that the load dispatcher operates the system.

The Federal Communications Commission has recently allocated a radio channel to the public utilities for dispatching emergency service cars and my company was among the first to adopt this modern means of communication. We have a 50-watt fixed station with its transmitter remotely controlled from the load dispatcher's office and emergency cars are equipped with both sending and receiving equipment. The dispatcher is in constant touch with these emergency service cars and he has found this space radio to be invaluable in restoring service in times of emergencies. It must be remembered, however, that the system operator can do no better job than the tools with which he has to work. Too often we have found his office inadequately equipped with the necessary electrical instruments to guide him in operating the system, and this is a grave mistake on the part of those responsible for it. Some officials are inclined to shy at any additional expense in this office simply because it cannot be classified as "revenue producing," but such is, to my way of thinking, a mistake. The load dispatcher should be provided with everything necessary to operate the system in the most efficient and economical manner and once this has been done, he should so conduct himself as to obtain that end. The rank and file of employees are not always concerned about company expenses. Perhaps if they were better advised as to the overall cost of operating their companies, they would be more concerned. A company may have poor public relations and still manage to stay in business, but when it runs out of money it can do little more than fold up.

We hear and read so much about the importance of carefully selecting employees and that is well and good, but the selection of department heads and supervisors is far more important. Employees are like small growing children. If they are never taught anything about economy and discipline, they will never know anything about it. Department heads and supervisors reflect whatever attitude they may have about business economy to their employees. I do not believe that any employee wishes to willfully waste money for his or her company. If they do so, they are probably doing it out of simple carelessness. Too frequently department heads and supervisors sort of grow into their jobs. They are sometimes chosen *solely on their seniority standing*. This is a mistake. The mere fact that Jim has been with the company longer than John is not sufficient cause to promote Jim to a foremanship when John might be the better man for the job, but such things unfortunately do sometimes seem to happen. The supervisor who has the loyal support and hearty cooperation of his men is a valuable asset to his company.

This can only be won by first winning the respect and confidence of the employees, and this comes from fair dealing. It is the supervisor who *practices* the Golden Rule, rather than he who just preaches it, that wins the confidence of his men. Employees must be made to realize that whatever success comes to their company will be partially shared with them in increased wages and better working conditions, and it should be so. I know a man who has consistently done this with his employees for more than 20 years and whenever the lean years came and revenues dropped sharply, these employees took wage cuts, and just as soon as revenues would increase sufficiently to warrant it, these cuts were restored to them. Once the employee is made to feel that he or she is a part of the company and not just a stopgap, they will be more concerned about their company's welfare. Perhaps if they were told more about operating and maintenance expenses, they would become more conscious of the need to economize. The average employee doesn't know beans about his or her company's operating expenses and the reason he or she doesn't know is that the employee has never been properly told. I do not mean that a lineman should be able to prepare a consolidated balance sheet, but he should be told more about the items of expense that go into it. Take the right-of-way charges, insurance, damage claims, regulatory fees, franchise fees, taxes, etc., all of which make fine food for thought if properly prepared and given to the employees by some competent person.

I know, from experience, that it is possible to get employees interested in something other than just the work assigned to them. Again I say that whenever the employee is made to feel that he or she is definitely a part of the company, he or she will take a greater interest in his or her own work and will be interested in what the other fellow is doing. Let there be more time and thought given to teaching the employee a broader understanding of the company's business and the value of economy to the company, the employee and the customer. The place to start is at the top of the ladder and work down.

Partnership of Utility and Retailer

(*Continued from page* 342)

every instance the dealer is considered as an effective ally. "The early spirit of occasional antagonistic competition has been positively replaced with an honest endeavor on the part of the utility to promote, assist and encourage the dealer to become more effective."

Based on information received from the 146 reporting companies, the Committee believes it reasonable to conclude that cordial and mutually beneficial relationships can be established with the retail trade under either a direct merchandising program or a strictly promotional one. Local markets, dealer representation, and other conditions will influence company procedure in selling practices, but there is no indication that dealer initiative is stifled by any broad-gauged cooperative merchandising policy on the part of the utility company.

Tree Clearance for Overhead Electric Lines—Preliminary Suggestions

Interim report of the Tree Clearance Subcommittee of the Transmission and Distribution Committee, EEI.

By G. D. Blair
Consumers Power Company

Presented at 25th Meeting of Transmission and Distribution Committee, EEI, Chicago, May 5-7, 1941

THESE suggestions have been developed by the subcommittee from its 2½-years study of the economic and physical aspects of tree interference in the construction, maintenance and operation of overhead electric lines. They are intended as information to serve as an interim guide until suggestions for line clearances suitable for the industry may be decided upon. Probably one year or more will be required for the committee to complete its work and submit a final report.

In view of this and the fact that the suggestions herewith listed cover most of the essential points to be observed by operating companies, it is urged that copies of this information be made available to all engineers, line superintendents, general foremen, right of way men, tree trimming supervisors and foremen, and others who have any interest in line design and maintenance.

Design and Right of Way

Planning of overhead line structures to fit field conditions in advance of building is of first importance in providing and maintaining satisfactory tree and wire relations. Adequacy of tree clearance, economical cost of line construction, maintenance and operation, reliable service and good public relations are largely dependent upon careful initial attention to the following items:

(a) In locating new transmission and primary distribution lines practice deliberate tree avoidance, where economically justifiable.

(b) Emphasize selection of tree-free right of ways of private property as well as in public places wherever permissible.

(c) Develop and apply best economic balance between pole material costs and tree trimming costs, both initial construction and future maintenance considered, especially where conductors are above tree crowns.

(d) Appraise in advance the degree of line security required from tree interference and specify the construction, design and location to secure objective.

(e) Recognize basic *tree form at maturity* as an important factor controlling pole heights and conductor position.

(f) Design and install all overhead conductors including secondaries, power and street lighting wires to avoid central tree trunks and large limbs.

(g) Recognize and allow for variation in annual growth rates between different tree species subject to local environmental effects of soil, moisture and climate. (See Table I.)

(h) Apply wood strength knowledge of various tree species especially where conductors are to be placed under or at the side of tree crowns. (See Fig. 1.)

(i) In the northern and central states, design new primary distribution and transmission lines to provide at least two years' tree clearance between retrims.

(j) From operating experience develop local average growth rate charts on a tree species basis for use in guiding overhead line design.

Construction

(a) Fully realize the significance of the fact that as a rule the original amount and quality of tree clearance definitely fixes the pattern for future retrims at each individual location.

(b) Avoid topping of trees where clearance requirements will permit.

(c) Install only poles of proper lengths to fit field conditions encountered. Great over-all benefits will accrue from careful observance of this point.

(d) When installing primary or transmission lines near young immature trees, make allowance for future necessary growth enlargement of crowns.

(e) Wherever possible secure some offset of pole and tree trunk alignments.

(f) Where possible and permissible, alter standard crossarm and insulator arrangement to obtain greatest separation of conductors from trees.

(g) To properly protect plant investment against early and rapid depreciation, trim trees as required when initially installed to clear all electric conduc-

TABLE I—ANNUAL GROWTH OF VARIOUS TREES

Type	*Species—Common Name*	**Avg An. Gr. Rate in Feet*	*Max. Ht. in Feet*	*Wood Strength (Green) Lb/Sq In.*
Upright	Carolina poplar	2.67	80	5,300
	American elm	1.21	85	7,200
	Sycamore	1.07	75	6,500
	Silver maple	1.30	65	5,800
	Hickory	.93	65	11,000
	Norway spruce	1.50	60	Not available
	Lombardy poplar	1.50	60	Not available
Spreading	Sugar maple	.81	65	9,400
	Red oak	1.00	65	6,900
	White oak	.81	65	8,300
	Black walnut	.87	70	9,500
	Red maple	1.13	45	7,700
	Live oak	1.11	50	11,930
Horizontal	Norway maple	.72	50	Not available
	Black willow	1.67	50	3,800
	Box elder	1.33	40	Not available

*Approximate *normal* average rates in northern states, subject however to considerable variation due to soil, moisture and site conditions. As pruning stimulates growth, these values should be approximately tripled to arrive at first year growth rate of topped trees.

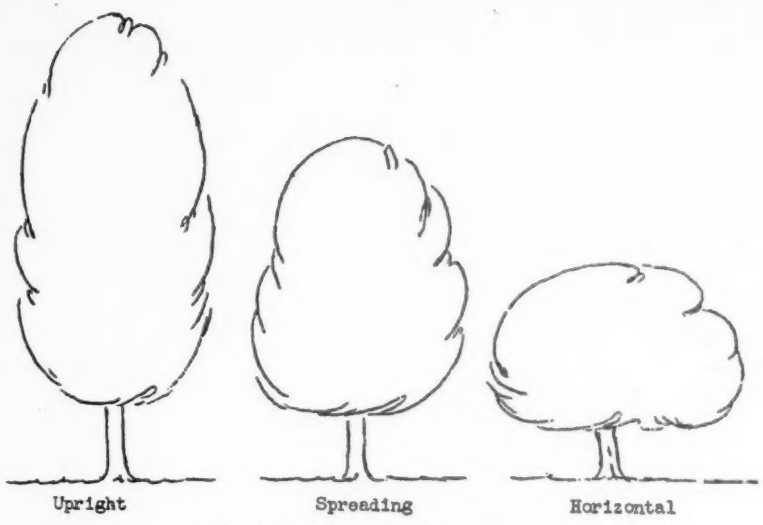


Fig. 1—Main Types of Tree Shapes

tors, including services, secondaries, power and street lighting.

(h) Where permissible, remove all dead and weak trees which are a hazard to new transmission and primary distribution lines.

(i) In the details of performing tree work during construction, observe all points listed under "Operation" immediately following.

Operation

Along all electric lines which have been engineered and built for adequate tree clearances, initial trimming, also retrimming for maintenance of essential operating conditions, resolves itself largely into an orderly routine application of *tree control* principles.

(a) Retrim at regular intervals, preferably each two years, and before new growth reaches primary lines and greater separation with transmission lines. This procedure provides greatest protective benefits and tends to maintain better individual tree condition.

(b) Concentrate on weed tree removal and removal of other trees which are hazardous to electric service.

(c) Make all cuts so as to leave no stubs.

(d) Treat all wounds against the entrance of decay and insect infections.

(e) In all trimming endeavor to preserve natural tree forms.

(f) Where permissible, remove unsightly trees caused by previous improper line clearance work.

(g) Where trees have outgrown original pole heights or other line appurtenances, seek line alterations before retrimming.

(h) Establish a standard minimum amount of clearance for each construction type and each tree species in any operating region and strive diligently to achieve a good degree of compliance therewith.

(i) Carefully consider the possibilities of joint tree clearance operations with other overhead line utilities located on the same poles or same side of public thoroughfare if equitable and workable arrangements can be made.

(j) Cooperate and coordinate closely with agents of public authorities where line clearance work is required in public places.

(k) For standard method of evaluation of cost of tree trimming, measure operations by cost per meter and average cost per mile of pole line, and fully appreciate the effect of average tree density per mile of line upon these unit costs.

(l) Never leave any debris from tree work in public places and on private property; always make definite arrangements for suitable disposal.

General Policy

(a) Adopt routine policy throughout engineering, construction and operation departments of tree avoidance where economically possible and for other justifiable reasons in overhead line work.

(b) Recognize tree work for overhead line clearance as a separate branch of electric utility work.

(c) Employ only trained tree workers as such procedure provides the most effective and economical results.

(d) Employ professional foresters or the equivalent to supervise both construction and operating line clearance programs.

(e) Authorize a policy of careful cooperation with public thoroughfare people and insist that it be applied in field details. An extension of this plan is to arrange conferences to discuss mutual problems with city, state and county, street and highway departments. This or similar procedure should be helpful in most states.

(f) Approve a workable plan of tree replacement for tree removals, to be applied with proper discretion by field forces.

(g) In trimming trees for either construction or operating line clearance, always consult property owners for their wishes before starting tree work unless previously and definitely arranged for.

(h) A tree density survey through which any line clearance program may be definitely appraised and analyzed is recommended for those operating companies which are interested in definitely evaluating the scope of this operation.

(i) Avoid cash payments for tree removal and trimming rights on public thoroughfares as such practice often reflects on constructive policy.

The major objectives toward which this subcommittee is working are enumerated as follows:

(a) Reduce over-all costs due to trees in the construction, operation and maintenance of overhead lines.

(b) Encourage standardization of electric utility tree work for overhead line clearance.

(c) Stimulate a greater degree of attention by the electric industry to tree preservation within permissible limits.

(d) Inform the electric industry on the scope of the tree interference problem, and devise the most satisfactory solution.

Survey Shows Growth of Air Conditioning

A DEFINITE trend toward smaller capacity individual air conditioning units, sharp increases in number of air conditioning installations in residences and public buildings, and only minor changes in the total of air conditioning installations of office buildings, theatres, etc., are shown in the Air Conditioning Survey for 1940, conducted by the Edison Electric Institute. The survey covers last year's air conditioning activities of 177 electric utility companies, serving a total population of 79,462,730, or almost two-thirds of the nation's population.

The number of air conditioning installations reported totals 63,468, with a total horsepower of 1,083,121, and is broken down into thirty classifications.

Personnel of E. E. I. Committees for 1941-1942

APPOINTMENTS to EEI Committees for the administrative year 1941-1942 have been made by President Kellogg, with the exception of the Accounting Executive Committees and other accounting committees, whose membership will be announced in a subsequent issue.

The Committees which now have practically complete personnel are shown under the following general headings of Engineering, General Sales and General.

Engineering: Accident Prevention Committee; Electrical Equipment Committee; Meter and Service Committee; Hydraulic Power Committee; Prime Movers Committee; Transmission and Distribution Committee.

General Sales: General Sales Committee; Air Conditioning Committee; Electrical Water Heating Committee; Farm Sales Committee; Home Lighting Equipment Sales Committee; Home Service Committee; Household Appliances Committee; Lighting Sales Committee; Power and Heating Sales Committee; Utility-Dealer Sales Committee; Wiring Sales Committee.

General: Insurance Committee; Membership Committee; Prize Awards Committee; Rate Research Committee; Statistical Committee.

The personnel of the Operating Committee is listed on the inside of the back cover of the BULLETIN.

ENGINEERING COMMITTEES

ACCIDENT PREVENTION COMMITTEE

Chairman, GEORGE S. DIEHL, Pennsylvania Water & Power Co., Baltimore, Md.

Secretary, A. B. CAMPBELL, Edison Electric Institute, New York, N. Y.

R. A. BLOOMSBURG, Niagara Hudson Power Corp., Albany, N. Y.

C. B. BOULET, Wisconsin Public Service Co., Milwaukee, Wis.

F. W. BROCKHOFF, Union Electric Co. of Missouri, St. Louis, Mo.

W. A. BUCHANAN, Appalachian Electric Power Co., Welch, W. Va.

H. J. BURTON, Consumers Power Co., Jackson, Mich.

F. H. DAVIS, The Detroit Edison Co., Detroit, Mich.

B. K. DUNSHEE, Pacific Gas & Electric Co., San Francisco, Cal.

R. C. GEPPERT, Nebraska Power Co., Omaha, Neb.

ROY M. GODWIN, Philadelphia Electric Co., Philadelphia, Pa.

E. E. GROVER, The Columbus & Southern Ohio Electric Co., Columbus, O.

EDWARD A. HOLDEN, Ebasco Services Inc., New York, N. Y.

E. J. KREH, Duquesne Light Co., Pittsburgh, Pa.

DON T. LACEY, Central Illinois Public Service Co., Springfield, Ill.

WILLS MACLACHLAN, 50 Oakwood Avenue, Toronto, Can.

C. N. RAKESTRAW, The Cleveland Electric Illuminating Co., Cleveland, Ohio.

ALBERT A. RALL, Kansas City Power & Light Co., Kansas City, Mo.

W. T. ROGERS, Ebasco Services Inc., New York, N. Y.

W. R. SMITH, Public Service Electric & Gas Co., Newark, N. J.

J. O. SPEED, Alabama Power Co., Birmingham, Ala.

H. O. SPRINKLE, Monongahela West Penn Public Service Co., Fairmont, W. Va.

D. C. STEWART, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

H. F. WEBB, West Penn Power Co., Pittsburgh, Pa.

ELECTRICAL EQUIPMENT COMMITTEE

Chairman, R. W. WILBRAHAM, United Engineers & Constructors Inc., Philadelphia, Pa.

Secretary, H. E. KENT, Edison Electric Institute, New York, N. Y.

L. BIRCKHEAD, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

F. S. BROWN, DUQUESNE LIGHT CO., Pittsburgh, Pa.

G. O. BROWN, Kansas City Power & Light Co., Kansas City, Mo.

R. N. CONWELL, Public Service Electric & Gas Co., Newark, N. J.

R. P. CRIPPEN, Ebasco Services Inc., New York, N. Y.

S. M. DEAN, The Detroit Edison Co., Detroit, Mich.

H. E. DEARDORFF, The Dayton Power & Light Co., Dayton, Ohio.

A. G. DEWARS, Northern States Power Co., Minneapolis, Minn.

HENRY A. DRYAR, Philadelphia Electric Co., Philadelphia, Pa.

H. W. EALES, Public Utility Engineering & Service Corp., Chicago, Ill.

E. S. FIELDS, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

H. S. FITCH, West Penn Power Co., Pittsburgh, Pa.

E. S. FITZ, Virginia Electric & Power Co., Richmond, Va.

J. H. FOOTE, The Commonwealth & Southern Corp., Jackson, Mich.

LESTER R. GAMBLE, The Washington Water Power Co., Spokane, Wash.

W. E. GUNDLACH, Wisconsin Electric Power Co., Milwaukee, Wis.

G. E. HEIDENREICH, Columbia Engineering Corp., Cincinnati, Ohio.

R. T. HENRY, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

E. A. HESTER, Duquesne Light Co., Pittsburgh, Pa.

C. T. HUGHES, The Connecticut Light & Power Co., Waterbury, Conn.

J. COLEMAN JONES, Florida Power & Light Co., Miami, Fla.

H. J. KLUMB, Rochester Gas & Electric Corp., Rochester, N. Y.

F. A. LANE, American Gas & Electric Service Corp., New York, N. Y.

S. J. LISBERGER, Pacific Gas & Electric Co., San Francisco, Cal.

C. W. MAYOTT, The Connecticut Valley Power Exchange, Hartford, Conn.

CARL D. PRICE, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.

G. E. QUINAN, Puget Sound Power & Light Co., Seattle, Wash.

H. B. ROBINSON, Carolina Power & Light Co., Raleigh, N. C.

H. J. SCHOLZ, The Commonwealth & Southern Corp., Birmingham, Ala.

E. B. SHEW, Philadelphia Electric Co., Philadelphia, Pa.

A. E. SILVER, Ebasco Services Inc., New York, N. Y.

L. M. SMITH, Alabama Power Co., Birmingham, Ala.

PHILIP SPORN, American Gas & Electric Service Corp., New York, N. Y.

NICHOLAS STAHL, Pennsylvania Power & Light Co., Allentown, Pa.

STANLEY STOKES, Union Electric Co. of Missouri, St. Louis, Mo.

B. VAN NESS, JR., Pennsylvania Water & Power Co., Baltimore, Md.

H. L. WALLAU, The Cleveland Electric Illuminating Co., Cleveland, Ohio.

H. B. WOOD, Stone & Webster Engineering Corp., Boston, Mass.

METER AND SERVICE COMMITTEE

Chairman, F. E. DAVIS, The Commonwealth & Southern Corp., Jackson, Mich.

A. S. ALBRIGHT, The Detroit Edison Co., Detroit, Mich.

H. A. BROWN, Rochester Gas & Electric Corp., Rochester, N. Y.

H. A. HOWERY, Kansas City Power & Light Co., Kansas City, Mo.

EDGAR L. HUGHES, Pacific Gas & Electric Co., San Francisco, Cal.

E. E. KLINE, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

E. A. LEFEVER, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

D. K. MCILVAINE, West Penn Power Co., Pittsburgh, Pa.

L. D. PRICE, Public Service Electric & Gas Co., Newark, N. J.

J. N. SCHWARTZ, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.

B. Z. SEGALL, New Orleans Public Service Inc., New Orleans, La.

W. G. STEINBRIGHT, Philadelphia Electric Co., Philadelphia, Pa.

H. L. THOMSON, The Hartford Electric Light Co., Hartford, Conn.

W. L. WADSWORTH, Northern States Power Co., Minneapolis, Minn.

C. F. WHITEMAN, The Cleveland Electric Illuminating Co., Cleveland, Ohio.

C. P. ZIMMERMAN, American Gas & Electric Service Corp., New York, N. Y.

HYDRAULIC POWER COMMITTEE

Chairman, E. B. STROWGER, Buffalo, Niagara & Eastern Power Corp., Buffalo, N. Y.

R. E. ARGERSINGER, Stone & Webster Engineering Corp., Boston, Mass.

A. C. CLOGHER, Ebasco Services Inc., New York, N. Y.

E. H. COLLINS, The Washington Water Power Co., Spokane, Wash.

ALBION DAVIS, Union Electric Co. of Missouri, St. Louis, Mo.

PAUL M. LEFEVER, Susquehanna Electric Co., Conowingo, Md.

E. S. LOANE, Pennsylvania Water & Power Co., Baltimore, Md.

E. L. PETERSON, American Gas & Electric Service Corp., New York, N. Y.

PRIME MOVERS COMMITTEE

Chairman, J. A. KEETH, Kansas City Power & Light Co., Kansas City, Mo.

W. H. ALDRICH, The Cleveland Electric Illuminating Co., Cleveland, Ohio.

T. B. ALLARDICE, American Gas & Electric Service Corp., New York, N. Y.

J. R. BAKER, Pennsylvania Water & Power Co., Baltimore, Md.

C. C. BALTZLY, Philadelphia Electric Co., Philadelphia, Pa.

H. N. BOETCHER, Consolidated Gas Electric Light & Power Co., Baltimore, Md.

F. S. CLARK, Stone & Webster Engineering Corp., Boston, Mass.

CHARLES W. E. CLARKE, United Engineers & Constructors Inc., Philadelphia, Pa.

SABIN CROCKER, The Detroit Edison Co., Detroit, Mich.

E. R. CROFTS, Rochester Gas & Electric Corp., Rochester, N. Y.

H. M. CUSHING, Buffalo Niagara Electric Corp., Buffalo, N. Y.

G. C. Daniels, The Commonwealth & Southern Corp., Jackson, Mich.

F. L. DORNBROOK, Wisconsin Electric Power Co., Milwaukee, Wis.

DWIGHT DOUGLASS, The Hartford Electric Light Co., Hartford, Conn.

J. M. DRABELLE, Iowa Electric Light & Power Co., Cedar Rapids, Iowa.

W. V. DRAKE, Monongahela West Penn Public Service Co., Fairmont, W. Va.

W. C. DRUMMOND, Public Utility Engineering & Service Corp., Chicago, Ill.

J. N. EWART, Buffalo Niagara Electric Corp., Buffalo, N. Y.

F. P. FAIRCHILD, Public Service Electric & Gas Co., Newark, N. J.

C. Z. GILLIVAN, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.

FRANK HENRY, Rochester Gas & Electric Corp., Rochester, N. Y.

G. D. HETTRICK, Montaup Electric Co., Fall River, Mass.

H. G. HEIBLER, Houston Lighting & Power Co., Houston, Texas.

E. L. HOPPING, Philadelphia Electric Co., Philadelphia, Pa.

A. T. HUTCHINS, The Commonwealth & Southern Corp., Birmingham, Ala.

E. T. KECK, Texas Power & Light Co., Dallas, Texas.

H. A. KLEINMAN, Peoples Power Co., Moline, Ill.

A. H. Krauss, Ebasco Services Inc., New York, N. Y.

E. H. KRIEG, American Gas & Electric Service Corp., New York, N. Y.

D. C. LUCE, Public Service Electric & Gas Co., Newark, N. J.

J. M. MACKENZIE, Consumers Power Co., Jackson, Mich.

H. C. MILLER, Public Service Electric & Gas Co., Irvington, N. J.

E. H. MITSCH, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

J. F. MUIR, American Water Works & Electric Co., Inc., New York, N. Y.

A. R. PARKER, Columbia Engineering Corp., Cincinnati, Ohio.

R. C. POWELL, Pacific Gas and Electric Co., San Francisco, Cal.

T. E. PURCELL, Duquesne Light Co., Pittsburgh, Pa.

G. C. SEARS, Puget Sound Power & Light Co., Seattle, Wash.

G. W. SMITH, San Antonio Public Service Co., San Antonio, Texas.

M. F. STACK, Ebasco Services Inc., New York, N. Y.

ROBERT M. VAN DUZER, JR., The Detroit Edison Co., Detroit, Mich.

CORNELIUS C. WHELCHEL, Buffalo, Niagara Electric Corp., Buffalo, N. Y.

G. V. WILLIAMSON, Union Electric Co. of Missouri, St. Louis, Mo.

TRANSMISSION AND DISTRIBUTION COMMITTEE

Chairman, E. V. SAYLES, The Commonwealth & Southern Corp., Jackson, Mich.

Secretary, A. B. CAMPBELL, Edison Electric Institute, New York, N. Y.

JOHN BACKUS, Portland General Electric Co., Portland, Ore.

H. E. BRAUNIG, Gulf States Utilities Co., Beaumont, Texas.

G. W. BEAN, Texas Electric Service Co., Fort Worth, Texas.

A. BODICKY, Union Electric Co. of Missouri. St. Louis, Mo.

A. S. BROOKS, Public Service Electric & Gas Co., Newark, N. J.

R. A. BROWN, The Columbus & Southern Ohio Electric Co., Columbus, Ohio.

E. S. BUNDY, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

D. M. BUNN, Northern States Power Co., Minneapolis, Minn.

P. J. CARLIN, Florida Power & Light Co., Miami, Fla.

GILBERT COOLEY, Long Island Lighting Co., Roslyn, N. Y.

C. C. CORNELIUS, Kansas City Power & Light Co., Kansas City, Mo.

R. R. COWLES, Pacific Gas & Electric Co., San Francisco, Cal.
M. T. CRAWFORD, Puget Sound Power & Light Co., Seattle, Wash.
H. A. DAMBLY, Philadelphia Electric Co., Philadelphia, Pa.
R. F. DANNER, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
W. R. DOAR, Carolina Power & Light Co., Raleigh, N. C.
ROY L. DODD, Wisconsin Electric Power Co., Milwaukee, Wis.
H. A. ENOS, American Gas & Electric Service Corp., New York, N. Y.
F. H. FERGUSON, Puget Sound Power & Light Co., Seattle, Wash.
G. H. FIEDLER, Rochester Gas & Electric Corp., Rochester, N. Y.
L. B. FULLER, Portland General Electric Co., Portland, Ore.
W. E. GUNDLACH, Wisconsin Electric Power Co., Milwaukee, Wis.
EDWIN HANSSON, Pennsylvania Water & Power Co., Baltimore, Md.
T. G. HIERONYMUS, Kansas City Power & Light Co., Kansas City, Mo.
M. D. HOOVEN, Public Service Electric & Gas Co., Newark, N. J.
H. W. KELLER, Columbia Engineering Corp., Cincinnati, Ohio.
F. A. KENDIG, The Dayton Power & Light Co., Dayton, Ohio.
C. H. KRAFT, Union Electric Co. of Missouri, St. Louis, Mo.
J. P. LEWIS, The Connecticut Power Co., Stamford, Conn.
G. B. MCCABE, The Detroit Edison Co., Detroit, Mich.
C. B. MCMANUS, Georgia Power Co., Atlanta, Ga.
GEORGE MILLER, Louisville Gas & Electric Co., Louisville, Ky.
C. W. MINARD, Nebraska Power Co., Omaha, Neb.
JOSEPH MINI, JR., Pacific Gas & Electric Co., San Francisco, Cal.
R. E. MORSE, American Gas & Electric Service Co., New York, N. Y.
L. L. NEWMAN, New Orleans Public Service Inc., New Orleans, La.
C. T. NICHOLSON, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.
E. F. NEUZEL, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
W. F. NIMMO, Virginia Electric & Power Co., Richmond, Va.
E. W. OESTERREICH, Duquesne Light Co., Pittsburgh, Pa.
E. W. PACKER, Pennsylvania Power & Light Co., Allentown, Pa.
J. J. POKORNY, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
G. U. POLLARD, Buffalo Niagara Electric Corp., Buffalo, N. Y.
O. RUE, Central Illinois Public Service Co., Springfield, Ill.
B. C. RUSSELL, Idaho Power Co., Boise, Idaho.
FRANK SANFORD, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
H. P. SEELYE, The Detroit Edison Co., Detroit, Mich.
A. E. SILVER, Ebasco Services, Inc., New York, N. Y.
C. T. SINCLAIR, Duquesne Light Co., Pittsburgh, Pa.
L. G. SMITH, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
NICHOLAS STAHL, Pennsylvania Power & Light Co., Allentown, Pa.
P. B. STEWART, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
R. O. SUTHERLAND, The United Light & Power Service Co., Davenport, Iowa.
G. S. VAN ANTWERP, Philadelphia Electric Co., Philadelphia, Pa.
C. V. WADDINGTON, Kansas Gas & Electric Co., Wichita, Kansas.
J. S. WARE, Public Service Electric & Gas Co., Newark, N. J.
L. P. WORKS, Wisconsin Public Service Corp., Milwaukee, Wis.
C. A. YANUZZI, Pennsylvania Power & Light Co., Allentown, Pa.

SALES COMMITTEES

GENERAL SALES COMMITTEE

Chairman, R. E. FISHER, Pacific Gas & Electric Co., San Francisco, Cal.
Vice-Chairman, EDWIN VENNARD, Middle West Service Co., Chicago, Ill.
A. A. BROWN, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
F. A. COFFIN, Wisconsin Electric Power Co., Milwaukee, Wis.
C. A. COLLIER, Georgia Power Co., Atlanta, Ga.
R. D. CUTLER, The Hartford Electric Light Co., Hartford, Conn.
D. M. DEBARD, Stone & Webster Service Corp., New York, N. Y.
JOHN DEB SHEPARD, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
H. E. DEXTER, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
S. L. DRUMM, New Orleans Public Service Inc., New Orleans, La.
R. T. DUNCAN, The Detroit Edison Co., Detroit, Mich.
GEORGE W. HART, Ebasco Services Inc., New York, N. Y.
E. F. KELLY, Central Illinois Public Service Co., Springfield, Ill.
JOSEPH MCKINLEY, Duquesne Light Co., Pittsburgh, Pa.
A. D. MCLAY, The Detroit Edison Co., Detroit, Mich.
F. MCQUILLIN, West Penn Power Co., Pittsburgh, Pa.
C. E. MICHEL, Union Electric Co. of Missouri, St. Louis, Mo.
G. E. Miller, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
W. E. PARROTT, Ebasco Services Inc., New York, N. Y.
J. F. PORTER, JR., Kansas City Power & Light Co., Kansas City, Mo.
P. H. POWERS, West Penn Power Co., Pittsburgh, Pa.
HARRY RESTOFSKI, West Penn Power Co., Pittsburgh, Pa.
M. R. RODGER, Middle West Service Co., Chicago, Ill.
W. H. SAMMIS, The Commonwealth & Southern Corp., New York, N. Y.
H. M. SAWYER, American Gas & Electric Service Corp., New York, N. Y.
M. E. SKINNER, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.
MISS FERN SNIDER, Georgia Power Co., Atlanta, Ga.
H. P. STEINMETZ, Public Service Electric & Gas Co., Newark, N. J.
R. H. TILLMAN, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
C. M. TURNER, Ebasco Services Inc., New York, N. Y.
R. P. WAGNER, New York Power & Light Corp., Albany, N. Y.
G. E. WHITWELL, Philadelphia Electric Co., Philadelphia, Pa.
H. E. YOUNG, Northern States Power Co., Minneapolis, Minn.

AIR CONDITIONING COMMITTEE

Chairman, JOHN DEB. SHEPARD, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
E. A. FREUND, Union Electric Co. of Missouri, St. Louis, Mo.

E. W. GRAY, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
C. H. RANDOLPH, Wisconsin Electric Power Co., Milwaukee, Wis.
S. S. SANFORD, The Detroit Edison Co., Detroit, Mich.
F. C. WILSON, Kansas City Power & Light Co., Kansas City, Mo.

ELECTRIC WATER HEATING COMMITTEE

Chairman, C. M. TURNER, Ebasco Services Inc., New York, N. Y.
R. S. BELL, The Commonwealth & Southern Corp., New York, N. Y.
R. C. BRYCE, Philadelphia Electric Co., Philadelphia, Pa.
E. M. COBB, Ohio Power Co., Canton, Ohio.
HOWARD W. COOPER, Minnesota Power & Light Co., Duluth, Minn.
R. M. GIBSON, The Hartford Electric Light Co., Hartford, Conn.
L. F. RIEGEL, Gulf States Utilities Co., Beaumont, Texas.
C. J. STRIKE, Idaho Power Co., Boise, Idaho.
H. A. WALSH, El Paso Electric Co., El Paso, Texas.

FARM SALES COMMITTEE

Chairman, F. A. COFFIN, Wisconsin Electric Power Co., Milwaukee, Wis.
R. V. BAUER, Ebasco Services Inc., New York, N. Y.
MICHAEL A. CAFFREY, Brockton Edison Co., Brockton, Mass.
ROBERT K. DERRY, The Ohio Power Co., Canton, Ohio.
R. T. DUNCAN, The Detroit Edison Co., Detroit, Mich.
E. C. EASTER, Alabama Power Co., Birmingham, Ala.
R. E. HAYMAN, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
C. E. JEERINGS, Rochester Gas & Electric Corp., Rochester, N. Y.
R. T. JONES, Pennsylvania Power & Light Co., Allentown, Pa.
C. H. LEATHAM, Monongahela West Penn Public Service Co., Fairmont, W. Va.
J. C. SCOTT, Puget Sound Power & Light Co., Seattle, Wash.
H. A. SMITH, Nebraska Power Co., Omaha, Neb.

HOME LIGHTING EQUIPMENT SALES COMMITTEE

Chairman, HARRY RESTOFSKI, West Penn Power Co., Pittsburgh, Pa.
R. S. BELL, The Commonwealth & Southern Corp., New York, N. Y.
F. J. BROWN, Central New York Power Corp., Syracuse, N. Y.
J. F. DICKERHOFF, Long Island Lighting Co., Mineola, N. Y.
C. T. HESS, Puget Sound Power & Light Co., Seattle, Wash.
C. D. HOLLISTER, New York Power & Light Corp., Albany, N. Y.
H. A. KEYS, Northern States Power Co., Minneapolis, Minn.
MRS. B. E. MARSH, Nebraska Power Co., Omaha, Neb.
H. P. MEGARGEE, American Gas & Electric Service Co., New York, N. Y.
A. H. PALMATIER, Rockland Light & Power Co., Nyack, N. Y.
FRED STAACKE, Houston Lighting & Power Co., Houston, Texas.
M. J. STEDMAN, Pennsylvania Power & Light Co., Allentown, Pa.
C. A. STEVENS, Public Service Electric & Gas Co., Newark, N. J.
H. A. STROUD, Monongahela West Penn Public Service Co., Fairmont, W. Va.
J. S. SUTHERLAND, Alabama Power Co., Birmingham, Ala.

HOME SERVICE COMMITTEE

Chairman, MISS FERN SNIDER, Georgia Power Co., Atlanta, Ga.
MISS MARTHA BOHLSEN, Nebraska Power Co., Omaha, Neb.
MISS ESTHER LEE BRIDE, Union Electric Co. of Missouri, St. Louis, Mo.
MRS. VERA B. ELLWOOD, Wisconsin Electric Power Co., Milwaukee, Wis.
MISS NANCY FINCH, Utah Power & Light Co., Salt Lake City, Utah.
MISS FANNY MAY IZARD, Mississippi Power & Light Co., Jackson, Miss.
MISS ELIZABETH B. MURRAY, Atlantic City Electric Co., Atlantic City, N. J.
MISS NAOMI D. SHANK, Virginia Electric & Power Co., Richmond, Va.
MISS ANNE SUTTER, Duquesne Light Co., Pittsburgh, Pa.
MISS VALENTINE THORSEN, Northern States Power Co., Minneapolis, Minn.
MISS HARRIET G. WEST, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
MISS CLARA ZILLESSEN, Philadelphia Electric Co., Philadelphia, Pa.

HOUSEHOLD APPLIANCES COMMITTEE

Chairman, M. R. RODGER, Middle West Service Co., Chicago, Ill.
J. E. AVERETT, Savannah Electric & Power Co., Savannah, Ga.
H. A. KEYS, Northern States Power Co., Minneapolis, Minn.
T. E. KUYKENDALL, West Texas Utilities Co., Abilene, Texas.
AUSTIN MONTY, Philadelphia Electric Co., Philadelphia, Pa.
L. R. PARKER, The Commonwealth & Southern Corp., New York, N. Y.
C. A. STEVENS, Public Service Electric & Gas Co., Newark, N. J.

LIGHTING SALES COMMITTEE

Chairman, S. L. DRUMM, New Orleans Public Service Inc., New Orleans, La.
FRANK R. AUCHY, Philadelphia Electric Co., Philadelphia, Pa.
S. S. BRADFORD, The Potomac Edison Co., Hagerstown, Md.
C. T. BREMICKER, Northern States Power Co., Minneapolis, Minn.
N. H. COLLISSON, American Gas & Electric Service Corp., New York, N. Y.
C. G. GLUECK, Ebasco Services Inc., New York, N. Y.
B. J. JENSEN, Public Service Electric & Gas Co., Newark, N. J.
J. E. MUELLER, West Penn Power Co., Pittsburgh, Pa.
PHILIP PEEPLES, Georgia Power Co., Atlanta, Ga.
H. M. SHARP, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.
W. A. STANNARD, Consumers Power Co., Grand Rapids, Mich.
R. R. ST. JOHN, West Texas Utilities Co., Abilene, Texas.
C. A. TATUM, Dallas Power & Light Co., Dallas, Texas.
JOHN WALSH, Pacific Gas & Electric Co., San Francisco, Cal.

POWER AND HEATING SALES COMMITTEE

Chairman, F. McQUILLIN, West Penn Power Co., Pittsburgh, Pa.
Vice-Chairman, E. L. Kavanaugh, The Detroit Edison Co., Detroit, Mich.
H. W. BAY, Public Service Electric & Gas Co., Newark, N. J.
F. T. BROOKS, Philadelphia Electric Co., Philadelphia, Pa.
THOMAS BURNS, American Gas & Electric Service Corp., New York, N. Y.
E. M. CLAPP, Georgia Power Co., Atlanta, Ga.
J. H. COATES, Ebasco Services Inc., New York, N. Y.
J. R. HARTMAN, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
L. H. KNAPP, The Hartford Electric Light Co., Hartford, Conn.
P. D. LAWRENCE, Virginia Electric & Power Co., Richmond, Va.

C. H. PURDY, Consumers Power Co., Jackson, Mich.
E. L. ROBINSON, Gulf States Utilities Co., Beaumont, Texas.
CHARLES SNYDER, Monongahela West Penn Public Service Co., Fairmont, W. Va.
W. H. STUEVE, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
J. H. SCOTT, American Gas & Electric Service Corp., New York, N. Y.
C. P. YODER, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

UTILITY-DEALER SALES COMMITTEE

Chairman, R. P. WAGNER, New York Power & Light Corp., Albany, N. Y.
W. L. BERRY, Union Electric Co. of Missouri, St. Louis, Mo.
PAUL DELEON, Wisconsin Power & Light Co., Madison, Wis.
J. F. DERGE, Ebasco Services Inc., New York, N. Y.
H. G. ISLEY, Carolina Power & Light Co., Raleigh, N. C.
H. P. MEGARGEE, American Gas & Electric Service Corp, New York, N. Y.

WIRING SALES COMMITTEE

Chairman, GEORGE W. HART, Ebasco Services Inc., New York, N. Y.
MORISON BLAKE, Philadelphia Electric Co., Philadelphia, Pa.
E. A. BRAND, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.
F. E. DAVIS, The Commonwealth & Southern Corp., Jackson, Mich.
O. K. COLEMAN, American Gas & Electric Service Corp., New York, N. Y.
C. V. DUNN, Kansas City Power & Light Co., Kansas City, Mo.
C. M. FIFE, West Penn Power Co., Pittsburgh, Pa.
G. E. MILLER, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
H. R. STEVENSON, The Detroit Edison Co., Detroit, Mich.
R. C. WENZ, Duquesne Light Co., Pittsburgh, Pa.

GENERAL COMMITTEES

INSURANCE COMMITTEE

Chairman, J. H. NICKELL, Philadelphia Electric Co., Philadelphia, Pa.
A. R. BUCKMAN, Public Service Electric & Gas Co., Newark, N. J.
I. M. CARPENTER, Ebasco Services Inc., New York, N. Y.
F. H. DECKMAN, Columbia Engineering Corp., Columbus, Ohio.
REGINALD FLEMING, The Commonwealth & Southern Corp., New York, N. Y.
F. J. HOLUB, Duquesne Light Co., Pittsburgh, Pa.
WILLS MACLACHLAN, 50 Oakwood Ave., Toronto, Can.
JOHN L. MACLEOD, The Detroit Edison Co., Detroit, Mich.
J. G. REESE, Consolidated Gas Electric Light & Power Co., Baltimore, Md.
A. W. REID, American Gas & Electric Service Corp., New York, N. Y.

MEMBERSHIP COMMITTEE

Chairman, EDWARD REYNOLDS, Columbia Gas & Electric Corp., New York, N. Y.
W. J. HAGENAH, Public Utility Engineering & Service Corp., Chicago, Ill.
JUSTIN R. WHITING, The Commonwealth & Southern Corp., New York, N. Y.

PRIZE AWARDS COMMITTEE

Chairman, H. P. LIVERSIDGE, Philadelphia Electric Co., Philadelphia, Pa.
Secretary, LEWIS B. BEATTY, Philadelphia Electric Co., Philadelphia, Pa.
J. E. DAVIDSON, Nebraska Power Co., Omaha, Neb.
C. W. KELLOGG, Edison Electric Institute, New York, N. Y.

RATE RESEARCH COMMITTEE

Chairman, F. A. NEWTON, The Commonwealth & Southern Corp., New York, N. Y.
H. H. AGEE, Public Service Electric & Gas Co., Newark, N. J.
S. W. ANDREWS, American Gas & Electric Service Corp., New York, N. Y.
B. B. BECKETT, Pacific Gas and Electric Co., San Francisco, Cal.
IRA L. CRAIG, Philadelphia Electric Co., Philadelphia, Pa.
R. D. CUTLER, The Hartford Electric Light Co., Hartford, Conn.
E. D. DREYFUS, West Penn Power Co., Pittsburgh, Pa.
C. G. EICHELBERGER, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.
DONALD A. HENRY, Stone & Webster Service Corp., New York, N. Y.
J. T. KIMBALL, Niagara Hudson Power Corp., Buffalo, N. Y.
L. R. LEFFERSON, Ebasco Services Inc., New York, N. Y.
A. V. S. LINDSLEY, The Connecticut Light & Power Co., Waterbury, Conn.
C. E. NEIL, The North American Co., New York, N. Y.
H. H. PLANK, The United Gas Improvement Co., Philadelphia, Pa.
HARRY SNOW, The Detroit Edison Co., Detroit, Mich.
E. N. STRAIT, Public Utility Engineering & Service Corp., Chicago, Ill.
EDWARD VENNARD, Middle West Service Co., Chicago, Ill.

STATISTICAL COMMITTEE

Chairman, W. G. BOURNE, JR., The Commonwealth & Southern Corp., New York, N. Y.
DEWEY G. BAKER, Nebraska Power Co., Omaha, Neb.
C. D. HAMLIN, Niagara Hudson Power Corp., New York, N. Y.
ALAN W. HASTINGS, Engineers Public Service Co., Inc., New York, N. Y.
C. R. LANDRIGAN, The Detroit Edison Co., Detroit, Mich.
W. N. LEWIS, Ebasco Services, Inc., New York, N. Y.
LYLE MCDONALD, Public Service Electric & Gas Co., Newark, N. J.
WINSOR MARTIN, Public Utility Engineering & Service Corp., Chicago, Ill.
M. G. MILLER, West Penn Power Co., Pittsburgh, Pa.
W. T. NEEL, Philadelphia Electric Co., Philadelphia, Pa.
J. B. REID, Columbia Engineering Corp., New York, N. Y.
W. G. VINCENT, Pacific Coast and Electric Co., San Francisco, Cal.
C. L. WALLING, American Gas & Electric Service Corp., New York, N. Y.
Guest Member, T. H. BUCKLEY, Twin State Gas & Electric Co., Manchester, N. H.

Harvey C. Couch

HARVEY C. COUCH, president of the Arkansas Power and Light Company, and a member of the Board of Trustees of the Edison Electric Institute, died at his summer home, Couchwood, near Hot Springs, Ark. on July 30. Mr. Couch was 63 and had been in ill health for more than a year.

An outstanding leader in the public utility industry in the Southwest, Mr. Couch had a national reputation as an industrialist and public spirited citizen. Born at Magnolia, Ark. on Aug. 21, 1877, Mr. Couch's boyhood was spent on a farm in the southeastern part of that state. As a young man he conceived and built the first rural telephone line in southeast Arkansas and north Louisiana, later extending the system through Louisiana to Texas and Oklahoma. He entered the electric power field in 1913, with J. L. Longino and other associates, organizing the Arkansas Power and Light Co. at Arkadelphia and building the first transmission line in Arkansas. He and his associates built the first major hydro-electric plant in the state. By 1926 the company was serving a large part of the state and in that year it was reorganized as the Arkansas Power and Light Co. The system is now interconnected with the Louisiana Power and Light and the Mississippi Power and Light, sister companies. Mr. Couch organized all three companies, resigning as president of the Mississippi and Louisiana systems in 1936.

In recent years Mr. Couch had also been prominently identified with railroading as chairman of the board of the Louisiana and Arkansas Railway and of the Kansas City Southern Railway.

In addition to the utility and rail companies which he headed, Mr. Couch had many other interests. He was a director of the Reconstruction Finance Corporation from 1932 through 1934, and at the time of his death was a director of the 8th District Federal Reserve Bank of St. Louis. He served as fuel administrator for Arkansas during the World War, was chairman of the Arkansas Red Cross in 1927, the Arkansas Flood Control Commission in 1927 and the Arkansas Drought Relief committee in 1930.

Upon his return to Arkansas following resignation from the RFC, he immediately had the power companies which he headed develop a new type of rural line and undertook an extensive rural electrification program. When he returned to his native state he was honored by citizens of the entire state in a "Harvey Couch Day" program at Pine Bluff, with senators, congressmen, the Governor and leaders from every section present.

LeRoy O. Ripley

LEROY ORMAN RIPLEY, retired president of the Kansas Gas & Electric Co., and an outstanding Wichita business and civic leader, died in that city July 22, at the age of 64, after an illness of two days.

Born in Laurens, N. Y., Mr. Ripley received his bachelor of science degree from Union College in Schenectady. Following his graduation, he went to work in 1903 as superintendent of power for the Schenectady Railway Co. and the Schenectady Illuminating Co. Three years later he was promoted to manager of the latter concern.

In 1909 Mr. Ripley moved to Wichita as vice-president and operating executive of the newly organized Kansas Gas & Electric Co. In 1933 he was elected president. As a utility operator, Mr. Ripley was able to contribute his part to the development of the electric utility industry in his territory.

The use of high-voltage transmission lines to interconnect generating stations first came to Kansas in 1923, when the 132-kv. line was built from the company's plant near Parsons to Midian substation near El Dorado. In 1927 and 1928, as head of the company, Mr. Ripley had a great deal to do with the placing underground of the distribution lines in downtown Wichita. He was also active in building a system binding many communities together in southeastern Kansas. When in 1937 and 1938 it was decided to add another generating station to the Kansas Gas & Electric system it was the unanimous opinion of his associates and the owners of the utility property to name the new plant the Ripley Steam-Electric Station, in honor of the man who built the system of which it was a part.

While Mr. Ripley retired from active duty in June, 1940, he remained a consultant of the company until his death. Mr. Ripley was a member of the American Institute of Electrical Engineers.

Northwest Association Elects Officers

SAM P. MACFADDEN, vice-president of Puget Sound Power & Light Co., Seattle, was elected president of the Northwest Electric Light & Power Assn. at its annual meeting in Portland July 25. He will serve one year, succeeding C. J. Strike, president, Idaho Power Co., who has held the office during the administrative year just closed.

Mr. MacFadden has held an executive position with the Puget Sound company since 1932.

J. A. Hale, vice-president, Utah Power & Light Co., Salt Lake City, was named vice-president of the association at the same meeting. Vice-presidents for each state in the association territory were elected as follows: Idaho, R. S. Overstreet, Idaho Power Co., Boise; Montana, M. E. Buck, The Montana Power Co., Butte; Oregon, James H. Polhemus, Portland General Electric Co., Portland; Utah, W. A. Huckins, Utah Power & Light Co., Salt Lake City; Washington, D. B. Leonard, Pacific Power & Light Co., Yakima; and the province of British Columbia, W. C. Mainwaring, B. C. Electric Railway Co., Vancouver.

Elected members-at-large of the executive committee were, to represent the utilities, J. E. E. Royer, The Washington Water Power Co., Spokane; to represent jobbers and manufacturers, Harry A. Rogers, General Electric Supply Corp., Spokane, and H. C. Frost, Hurley Machine Co., Portland. Carrying hold-over terms on the executive committee are C. J. Strike, retiring president, and Z. E. Merrill, president, Mountain States Power Co., Albany.

President MacFadden appointed Berkeley Snow, Portland, executive secretary, and J. E. Anderson, Puget Sound Power & Light Co., Seattle, treasurer. He likewise appointed the following section chairmen for the year: Accounting & Business Practice, J. R. Thomas, The Montana Power Co., Butte; Business Development, D. J. McGonigle, The Montana Power Co., Butte; Engineering & Operation, M. T. Crawford, Puget Sound Power & Light Co., Seattle.

The executive committee will be called together in August to set up the year's activity.

Commercial Electric Cooking Council Prepares Sales Training Manual

WHAT does the average restaurant operator think of electric cooking equipment service—of electric cooking salesmen? Which talking points of what cooking appliances should be stressed when talking to owners of restaurant—cafeterias—tea rooms—soda fountains? Why do so many cooking equipment salesmen lose sales because of the way they use "Food Cost" in their presentations?

These questions, and many others equally important that face the commercial electric cooking salesman every day in every customer contact, are answered in the Commercial Electric Cooking Council's new "Sales Training Manual—Commercial Electric Cooking."

The manual has been written from the restaurant operator's point of view, expressly to increase the utility salesman's knowledge of this important group of customers. Chapters on the restaurant owner's likes and dislikes among salesmen, appliances, service, etc., how and why he buys equipment, the appliances needed in different types of food serving establishments, and the operating costs of various establishments, will prove of great value to the commercial cooking salesman, by giving him a broader insight into the customers' problems.

124 Selling Points

One hundred and twenty-four practical selling points to be used in contacts with restaurant operators are described, with suggestions for their most profitable use. Every important "reason-why" of electric cooking equipment, and the effect they produce in the operator's mind, are listed. What the operator expects of his equipment and what makes him buy are fully covered in this comprehensive section.

A check list of these talking points, arranged to show the relative importance of each point when used in selling operators of five types of food serving establishments—cafeterias, counter service, soda fountains, table service and tea rooms—is provided. Using this check list, the salesman can organize his sales presentation for greater effectiveness, by stressing his strongest arguments with each type of prospect.

Sales Training and Reference

The manual will not only be effective in sales training, the Council believes; it will also be of concrete assistance to every salesman as a constant reference in his daily work. Cub salesmen will find here the sales training they need in order to become quick producers; experienced men will receive an orderly picture of the knowledge they may have gained in hodge-podge fashion, and will get a new start toward more sales.

Copies of "Sales Training Manual—Commercial Electrical Cooking" are available from the Commercial Electric Cooking Council, 420 Lexington Ave., New York City. Price, one to four copies, $1.50 each; from five to 14 copies, $1.25 each; 15 copies and over, $1.00 each.

Direct Mail Pieces Prove Effective

Two direct mail pieces on commercial electric cooking, "Here's a Tip for Progressive Restaurant Operators" and "Does the Menu Ghost Haunt You?", prepared by the Council, have been used effectively by utilities. These folders drive home the profit potential of electric cooking for the restaurant man in terms of speed, accuracy, menu variety and cleanliness.

Prices of these two folders are $4.50 for 100 sets of two each, $4.25 per 100 sets for orders between 500 and 1000 sets, and $4.00 per 100 sets for orders of over 1000 sets.

"Food Service News" Proves Valuable to Utilities

"Food Service News" is the new title of the mailing piece on commercial electric cooking service published each month by the Commercial Electric Cooking Council. Formerly known as "Build Profits," this mailing piece provides a low-cost method of keeping restaurant owners informed of the most profitable ways in which to use electric cooking equipment.

The new title, the Council believes, will be more indicative of the purpose of the folder. Each issue contains actual testimonials of restaurant operators, in every part of the country, on their use of electric cooking equipment, and its accuracy, speed and convenience. Practical and profitable ideas for improving menu variety, special dishes that mean higher profits, and other information of daily use to operators are included in "Food Service News."

Utility companies find this publication an effective way to keep the company name and the benefits of electric commercial cooking service before this specified group of customers in a manner that helps the customer, and at a cost far below what would be involved if the utility were to prepare its own publication. "Food Service News," the Council feels, will prove of even greater value under its new name.

For prices on "Food Service News" address the Commercial Electric Cooking Council.

1940 Cooking Survey Shows Increased Revenue

The Commercial Electric Cooking Council Annual Survey, covering sales of commercial electric cooking for the year 1940, has just been released by J. F. Porter, Jr., Chairman of the Cooking Council.

This year's report includes the complete replies received from 84 utility operating companies. The results from commercial electric cooking promotion by these 84 companies shows an increase of $346,000 in 1940, or 65 per cent over revenues secured from this class of business in 1939.

The report has been divided into two parts, the first covering data on customers served, kilowatts sold, estimated kilowatt hours used and estimated revenue secured, and other useful information. The second part of the survey includes a summary of information on promotional activities of the utility operating companies.

This survey is undertaken each year by the Council to show the importance of this business, and continued growing interest on the part of utilities in its promotion. A considerable number of utilities reported commercial cooking promotion would be increased in 1941 through use of additional manpower and more extensive advertising.

Power Sales Manual Proves Helpful Both for Training and in Selling

THE Power Sales Manual prepared by the Power and Heating Sales Committee of the Institute, and recently off the press is receiving enthusiastic endorsement from electric utility power salesmen in all parts of the country.

The Committee as a whole, and the individual members who have worked together on the various sections of the Manual, are men with extensive and practical experience in selling utility services to industrial customers, and have given the industry the benefits of their knowledge and experience in the preparation of the Manual.

As pointed out in the Preface to the Manual, it is not nor is it intended to be a "canned" course in power sales. Rather, the Manual is the initial step in giving salesmen a usable sales tool which they may constantly refer to in carrying out their function of utility service selling. The mechanical features of the Manual, presented as it is in sections and bound in an attractive and practical binder, indicate that the Committee realizes that the Manual must be continually revised and brought up-to-date, as changes in the power sales picture warrant.

Salesmanagers will find the arrangement of the Manual (in sections) is most convenient for use as sales training material. Programs of sales training for industrial salesmen can be developed around the material in each Manual section and the sections released one at a time at each training session.

The first section of the Manual discusses the broad phases of power sales, the functions of the power salesman, his duties and qualifications. Other important phases of utility industrial selling, such as the market and the customer, are analyzed briefly, with suggestions for selling from the viewpoint of customer advantages. A further discussion of the use of sales tools, and the importance of coordinating the activities of manufacturers, dealers and other departments of the utility, will prove of interest and value to every power salesman.

Specific applications of utility services are dealt with in the succeeding sections of the Manual. One section contains practical data on electric furnace equipment, the various methods of using electric heat in industry and a comprehensive treatment of general heating problems.

The section on Infra-Red Heating condenses with great clarity the mass of data and experience that has accumulated on radiant heating, presenting the whole story in a fashion to eliminate confusion on the subject.

The history and scientific aspects of infra-red heating are first given and the remainder of the presentation concerns the direct and everyday needs of power salesmen and the power purchaser with regard to electric infra-red heating. Discussed in order are: Uses for Electric Infra-Red Heating; Test Procedure for Determining the Feasibility of Using Electric Infra-Red Heating; Electrical and Mechanical Construction of Infra-Red Ovens (with a few comments on Fire Safety Considerations); and finally Economics.

The photographs of the numerous applications of electric infra-red heating, and the discussion of its economics and inherent advantages are certain to be of great help to salesmen in suggesting solutions to the drying problems confronting industrial plant managers.

Another section describes the importance of industrial lighting and, in relatively few pages, gives the power salesman a working manual for selling the advantages of and minimum requirements for correct lighting in industry.

A section on commercial and industrial refrigeration pictorially presents the widespread applications of refrigeration. This section outlines the various refrigeration systems and contains pertinent data on this important utility service for large commercial and industrial customers.

The Air Conditioning and Ventilation section provides a check list of the advantages of air conditioning for commercial and industrial customers. It also describes the various methods used, and the economics for recommending one system over others in particular applications.

The section on Competition, is divided into three sub-sections, covering diesel engines, gas engines, and steam engines and turbines. Each contains highly useful material for positive selling and the meeting of competitive power threats. The performance and operating data, the list of items to consider in figuring costs, the calculation of comparative cost analyses, and the advantages of central station service so completely described in this section, should be most helpful to power salesmen, both in forestalling competitive threats and in outselling the engine salesmen.

The section on Industrial Development of Territory, offers practical suggestions for the part that should be played by utility industrial sales departments in securing new industries for territory served.

The comprehensive treatment of this important subject, with the results from surveys and suggested methods of securing new industries included, plus a complete outline of material to be included in an industrial survey, make this section most valuable to the utility carrying on an industrial development program.

These sections of the Power Sales Manual, which here have been summarized very briefly, will serve both as training material and as practical reference sources and valuable day-to-day selling aids, in helping the industrial power salesman to sell the numerous applications and advantages of central station service. Other sections in course of publication include the subjects of Adequate Wiring; Cooking and Baking; Stills and Sterilizers; Midget Heating Devices; Electrical Uses in the Petroleum Industry.

The Power Sales Manual is priced at $3.50 per copy to EEI member companies, and $5 per copy to non-member companies. Discounts are provided for larger orders as follows:

Member Company prices

10 to 24 copies	$3.50
25 or more	2.50

Non-Member prices

10 to 24 copies	$4.25
25 or more	3.50

EDISON ELECTRIC INSTITUTE
420 Lexington Ave. New York, N. Y.

PERSONALS

E. E. HUNTER, superintendent of generation of Oklahoma Gas and Electric Co., Oklahoma City, retired from active service August 1, after 37 years association with the company in the generation department. Mr. Hunter began as a boiler room helper in 1904 and progressed rapidly up the ladder, becoming superintendent of power plants in 1920 and superintendent of generation in 1929. Growth of the company's generation system closely parallels Mr. Hunter's career.

CECIL C. WILLIS, assistant superintendent of generation since 1936, has been named to succeed E. E. Hunter as superintendent of generation. He has been with the Oklahoma company for the 19 years since his graduation from the University of Kansas in 1922.

Succeeding Mr. Willis as assistant superintendent of generation is JOEL W. BLAKE, formerly mechanical engineer in the general department of the company.

MERRILL E. SKINNER, vice president of Buffalo, Niagara & Eastern Power Corp., has been elected president of the Buffalo Sight Conservation Society, an organization he was instrumental in founding in 1935.

FRANK MCLAUGHLIN, president of the Puget Sound Power and Light Co., has been named a member of the board of six trustees appointed by the Pacific Advertising Clubs Association to supervise advancement of a business program to promote better understanding between business and consumer in the nine Western states.

A. J. KIEFER has been named assistant secretary of the Louisville Gas and Electric Co., and L. E. ACKERSON has been appointed assistant treasurer. Both have been employed by the company for periods of about fifteen years in accounting.

DON MCGOWAN, advertising manager of the Consumers Power Co., has been named by Gov. Murray D. Van Wagoner as chairman of the business and industrial relations division of an information committee which is to serve as an advisory agency to the Michigan Defense Council.

Recent promotions in Nebraska Power Company:

GLEN A. WALKER, manager of the new business department of the Nebraska Power Company since 1939 has been appointed general sales manager. He has been with the utility since 1923, being industrial and power salesman until he became assistant manager of the rural division in 1936. Previously he had been superintendent of a power plant at Aurora, Neb.

FORD E. BATES, industrial sales manager since 1939 and an employee of the company since 1919, when he joined the engineering department was appointed general sales consultant for the company. DEWEY G. BAKER, company statistician for the past thirteen years, was named assistant to the president. ELDRED A. SWANSON, assistant substation engineer since 1930 was promoted to substation engineer to fill the vacancy caused by the death of W. R. HASELTON on April 19.

ELLSWORTH E. SCHWALM, assistant commercial sales manager for the past six months and previously industrial engineer, power salesman and supervisor of the commercial department for ten years, succeeds Mr. Bates as industrial sales manager. EDMUND H. LARSEN, a veteran of nearly twenty-two years service in the accounting department and assistant chief clerk of the general accounting department since 1937, succeeds the late ERNEST L. HECHT as chief clerk of that department.

L. C. MOORE, for ten years rural service supervisor for Portland General Electric Co., Portland, Ore., has left that company to devote his entire time to the S & M Flying Service, of which he is part owner. B. W. FABER, for the past six years rural sales representative at Hillsboro, Ore., for the company, succeeds Mr. Moore as rural sales supervisor with headquarters in Portland.

KENNETH C. JOHNSON, industrial engineer for the Arkansas Power and Light Co., Pine Bluff, has been named head of the power production and transmission division of the Arkansas Defense Council.

ROBERT H. FITE, JR., head of the sales department of Ebasco Services, Inc., has joined the operating consulting group. WILLIAM E. PARROTT, who has been chief sales sponsor for Ebasco, succeeds Mr. Fite, while F. W. OHLES, head of the sales consulting group, becomes chief sales sponsor. The new head of the sales consulting group is H. W. BRUSMAN, who has been sales sponsor for the South Central group of Electric Bond and Share operating companies.

R. E. KRAFVE, general sales manager of the Superior Water, Light and Power Company has accepted a general sales advisory position with Ebasco Services, Inc., according to an announcement by Howard J. Underhill, vice president and general manager of the Superior Company. LAWRENCE A. NICHOLS, JR., succeeds Mr. Krafve.

MELVIN L. ARNOLD, for the past six years associated with Jos. R. Gerber Co., a Portland advertising agency handling the Portland General Electric Co. account, has been appointed acting advertising manager for the utility. While with the Gerber Company Mr. Arnold worked on the company account and prepared much of its advertising copy. He succeeds RALPH MILLSAP, who, holding a commission in the Naval Reserve was recently ordered into active service at Annapolis.

WALTER C. WAGNER, superintendent of the meter division of the Philadelphia Electric Co. has been called into active service as a lieutenant commander of the Navy. W. G. STEINBRIGHT has been appointed to succeed Mr. Wagner.

Nebraska Power Wins Home Lighting Equipment Sales Contest

The Nebraska Power Company, Omaha, Nebraska, is the winner of the First Award of $500 in the Home Lighting Equipment Sales Contest for the first six months of 1941, sponsored by the Home Lighting Equipment Sales Committee of Edison Electric Institute.

The Second Award of $200 was won by Carolina Power & Light Company, Raleigh, N. C.; Third Award of $100 by West Penn Power Company, Pittsburgh, Pa., and four awards of $50 each were received by Monongahela West Penn Public Service Co., Fairmont, W. Va.; Pennsylvania Power & Light Co., Allentown, Pa.; Wisconsin Public Service Corp., Green Bay, Wis., and Texas Power & Light Co., Dallas, Texas.

The contest covered sales of I.E.S. lamps and other portables, Pin-to-Wall lamps, lighting fixtures, adapters, converters and modernizers, all equipped with proper size bulbs.

Recent EEI Publications

EFFECTS OF BONDING EXCHANGE AERIAL TELEPHONE CABLE SHEATHS TO MULTI - GROUNDED POWER NEUTRALS—ENGR. REPORT No. 43

E.E.I. Pub. H-10. A report of the Joint Subcommittee on Development and Research of the Edison Electric Institute and the Bell Telephone System, 16 pages. Price 30 cents to members and their employees; 75 cents to non-members in the U.S.A.; 85 cents to foreign countries.

IN this report results are given of an investigation of the shielding benefits derived by bonding the sheaths of aerial exchange telephone cables to multi-grounded power system neutrals. The theoretical discussion is supported by data from an extensive survey of the effects of sheath-neutral bonding on noise, low-frequency voltage and electrolysis conditions in the telephone plant. Both areas served by public water systems and non-water-pipe areas are covered.

POWER STATION CHEMISTRY—1940

E.E.I. Pub. H-11. A report of the Power Station Chemistry Subcommittee of the Prime Movers Committee, Edison Electric Institute, 20 pages. Price 40c. to members and their employees; $1.00 to non-members in the U.S.A.; $1.10 to foreign countries.

THIS report presents data on some of the activities currently being studied by the Subcommittee.

It includes data on determination of hydrogen evolution as reported by three operating companies. Description of the apparatus used and discussion of the information obtained is presented.

A progress report on the general subject "carry-over" is submitted which discusses the problem and outlines a program for future work.

The report also presents a description of an installation of a carbonaceous zeolite water softener which includes a summary of operating results and costs over a one-year period.

NEUTRALIZING TRANSFORMERS

E.E.I. Pub. H-12. A report of the Joint Subcommittee on Development and Research of the Edison Electric Institute and the Bell Telephone System, 16 pages. Price 30c. to members and their employees; 75c. to non-members in the U.S.A.; 85c. to foreign countries.

TWO types of neutralizing transformers are described in this report, one developed for use on communication circuits serving power stations, the other for reducing the effects of low-frequency induction on open-wire telephone lines. Data are given whereby the effectiveness of these transformers can be determined. Extensive use is being made of the former type, in its field of application of the latter type, in its present form, is limited and only one trial installation has been made.

CONVENTIONS AND MEETINGS

SEPTEMBER

3-5	Pennsylvania Electric Association, Bedford Springs Hotel, Bedford Springs, Pa.
4-5	Home Service Committee Conference, EEI, Auditorium, Gas and Electric Association, 480 Lexington Ave., New York, N. Y.
5-6	Maryland Utilities Association, Ocean City, Md.
11-13	Rocky Mountain Electric Association, Stanley Hotel, Estes Park, Colo.
12-13	Wisconsin Utilities Association, Accounting Section, Lawsonia Hotel, Green Lake, Wis.
22-25	Illuminating Engineering Society, Atlanta Biltmore Hotel, Atlanta, Ga.
24-26	Indiana Electric Association, French Lick Springs Hotel, French Lick Springs, Ind.

OCTOBER

2	Meter and Service Committee, EEI, New Ocean House, Swampscott, Mass.
6-7	Prime Movers Committee, St. Louis, Mo.
6-8	National Electrical Contractors Association, Rice Hotel, Houston, Texas
6-10	National Safety Council's 1941 Congress and Exposition, Stevens Hotel, Chicago, Ill.
8-10	American Institute of Electrical Engineers, Coronado Hotel, St. Louis, Mo.
12-15	American Society of Mechanical Engineers, Louisville, Ky.
13-14	Electrical Equipment Committee, EEI, Hotel Cleveland, Cleveland, Ohio
13-14	Wisconsin Utilities Association, Commercial and Technical Sections, Schroeder Hotel, Milwaukee, Wis.
14-17	National Electrical Wholesalers Association, Hotel Statler, Detroit, Mich.
19-24	American Welding Society, Bellevue Stratford Hotel, Philadelphia, Pa.
20-22	Transmission and Distribution Committee, EEI, Netherland Plaza Hotel, Cincinnati, Ohio
20-24	American Gas Association, Atlantic City, N. J.
27-31	National Electrical Manufacturers Association, Waldorf-Astoria Hotel, New York, N. Y.

DECEMBER

3-5	Congress of American Industry of the National Association of Manufacturers, Waldorf-Astoria Hotel, New York, N. Y.
3-5	American Institute of Electric Engineers, Southeastern District, St. Charles Hotel, New Orleans, La.

Better Light-Better Sight

(*Continued from page* 350)

The four window and counter displays use both action and on-and-off flasher equipment. Mass production makes them available at a reasonable price to every company. Soundly built and easily assembled, these displays present novel, eye-catching ideas that effectively demonstrate the difference between inadequate and Better Light.

The three consumer booklets employ a tested approach, with all the emphasis placed on the benefits and advantages of Better Light for residential, commercial and industrial customers. Inexpensive and suitable for wide distribution, these 12-page booklets drive home the sales points of Better Light in all its applications.

Twenty newspaper advertisements, 10 of which employ the educational theme, the remainder selling I.E.S. lamps, adaptors, proper size bulbs, etc., present the material for a comprehensive and cohesive advertising campaign. Two clip sheets, of reader articles on school, residential, office and factory lighting, are also supplied.

A special booklet entitled "Facts You Should Know About Your Eyesight," three special illustrated sections of *Better Light-Better Sight News,* radio scripts and two series of historical cartoons on light complete the program. A portfolio containing samples of some of the above materials and full descriptions of the others is available, and will be sent upon request to the National Better Light-Better Sight Bureau, 420 Lexington Ave., New York City.

OFFICERS AND COMMITTEES OF THE EDISON ELECTRIC INSTITUTE

1941-1942

OFFICERS

C. W. KELLOGG, *President*
420 Lexington Avenue, New York, N. Y.

PAUL M. DOWNING, *Vice-President*
Pacific Gas & Electric Co., San Francisco, Cal.

H. S. BENNION, *Vice-President & Managing Director*
420 Lexington Avenue, New York, N. Y.

J. E. DAVIDSON, *Vice-President*
Nebraska Power Co., Omaha, Neb.

J. C. LEIGHTON, *Treasurer*
Engineers Public Service Co., New York, N. Y.

W. E. MITCHELL, *Vice-President*
Georgia Power Co., Atlanta, Ga.

MAE B. WOODS, *Secretary*
420 Lexington Avenue, New York, N. Y.

OPERATING COMMITTEE

Chairman, C. W. KELLOGG, New York, N. Y.

E. R. ACKER, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

J. M. BARRY, Alabama Power Co., Birmingham, Ala.

H. C. BLACKWELL, The Cincinnati Gas & Electric Co., Cincinnati, Ohio.

H. B. BRYANS, Philadelphia Electric Co., Philadelphia, Pa.

W. H. BURKE, Ebasco Services Incorporated, New York, N. Y.

C. L. CAMPBELL, The Connecticut Light & Power Co., Hartford, Conn.

J. E. DAVIDSON, Nebraska Power Co., Omaha, Neb.

PAUL M. DOWNING, Pacific Gas and Electric Co., San Francisco, Calif.

E. T. GUSHEE, Union Electric Company of Missouri, St. Louis, Mo.

WILLIAM KELLY, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

FRANK MCLAUGHLIN, Puget Sound Power & Light Co., Seattle, Wash.

W. E. MITCHELL, Georgia Power Co., Atlanta, Ga.

J. F. OWENS, Oklahoma Gas & Electric Co., Oklahoma City, Okla.

W. H. SAMMIS, The Commonwealth & Southern Corp., New York, N. Y.

CHESTER C. SMITH, Kansas City Power & Light Co., Kansas City, Mo.

PHILIP SPORN, American Gas & Electric Service Corp., New York, N. Y.

E. C. STONE, Duquesne Light Co., Pittsburgh, Pa.

E. S. THOMPSON, American Water Works & Electric Co., New York, N. Y.

G. W. VAN DERZEE, Wisconsin Electric Power Co., Milwaukee, Wis.

P. S. YOUNG, Public Service Electric & Gas Co., Newark, N. J.

CHAIRMEN OF THE COMMITTEES

Accident Prevention, GEORGE S. DIEHL, Pennsylvania Water & Power Co., Baltimore, Md.

Accounting Executive, G. H. BOURNE, The Commonwealth & Southern Corp., New York, N. Y.

Classification of Accounts, to be announced.

Customers' Relations, Commercial Accounting and Collections, to be announced.

Depreciation, to be announced.

Plant Accounting and Records, H. B. HARDWICK, The Commonwealth & Southern Corp., New York, N. Y.

Purchasing Stores and Transportation, to be announced.

Electrical Equipment, R. W. WILBRAHAM, United Engineers & Constructors, Inc., Philadelphia, Pa.

Hydraulic Power, E. B. STROWGER, Buffalo Niagara & Eastern Power Corp., Buffalo, N. Y.

Insurance, J. H. NICKELL, Philadelphia Electric Co., Philadelphia, Pa.

Membership, EDWARD REYNOLDS, Columbia Gas & Electric Corp., New York, N. Y.

Prime Movers, J. A. KEETH, Kansas City Power & Light Co., Kansas City, Mo.

Prize Awards, H. P. LIVERSIDGE, Philadelphia Electric Co., Philadelphia, Pa.

Rate Research, F. A. NEWTON, The Commonwealth & Southern Corp., New York, N. Y.

General Sales, R. E. FISHER, Pacific Gas & Electric Co., San Francisco, Cal.

Statistical, W. G. BOURNE, JR., The Commonwealth & Southern Corp., New York, N. Y.

Transmission and Distribution, E. V. SAYLES, The Commonwealth & Southern Corp., Jackson, Mich.

Codes and Standards (a Subcommittee of the Operating Committee)
H. B. BRYANS, Philadelphia Electric Co., Philadelphia, Pa.

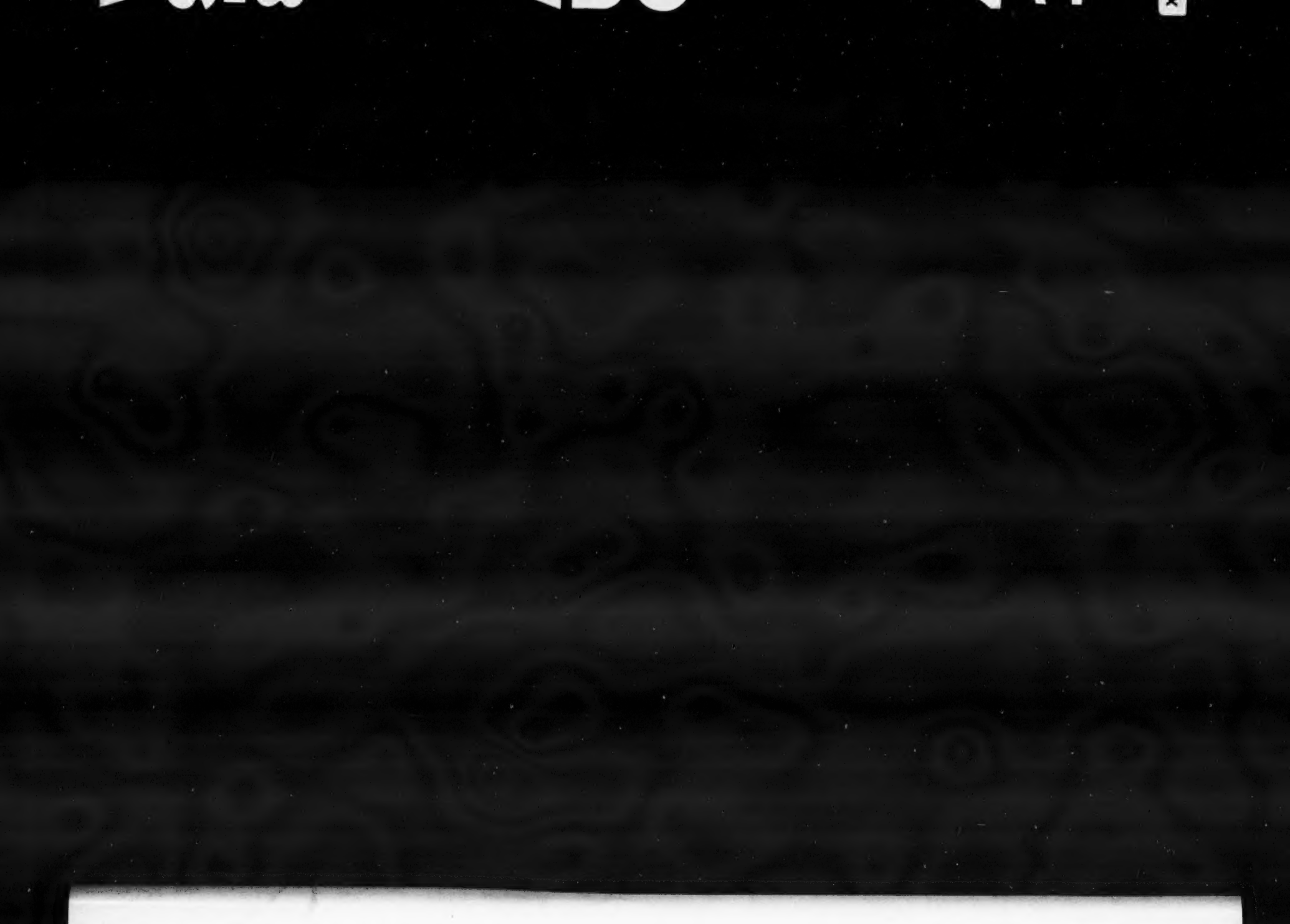
BOARD OF TRUSTEES
OF THE
EDISON ELECTRIC INSTITUTE
1941-1942

(*Terms expiring* 1942)

JAMES B. BLACK.....Pacific Gas and Electric Company, San Francisco, Cal.
JAMES F. FOGARTY.....The North American Company, New York, N. Y.
C. W. KELLOGG.....Edison Electric Institute, New York, N. Y.
B. W. LYNCH.....San Diego Gas & Electric Co., San Diego, Cal.
A. C. MARSHALL.....The Detroit Edison Company, Detroit, Mich.
THOMAS N. MCCARTER.....Public Service Electric and Gas Company, Newark, N. J.
H. HOBART PORTER.....American Water Works & Electric Company, Inc., New York, N. Y.
HERBERT A. WAGNER.....Consolidated Gas, Electric Light & Power Company of Baltimore, Baltimore, Md.
JUSTIN R. WHITING.....The Commonwealth & Southern Corporation, New York, N. Y.

(*Terms expiring* 1943)

HARVEY C. COUCH.....Arkansas Power & Light Company, Pine Bluff, Ark.
PHILIP G. GOSSLER.....Columbia Gas & Electric Corporation, New York, N. Y.
H. P. LIVERSIDGE.....Philadelphia Electric Company, Philadelphia, Pa.
WILLIAM MCCLELLAN.....Union Electric Company of Missouri, St. Louis, Mo.
P. L. SMITH.....Middle West Corporation, Chicago, Ill.
GEORGE N. TIDD.....American Gas & Electric Company, New York, N. Y.
JOHN E. ZIMMERMANN.....The United Gas Improvement Company, Philadelphia, Pa.

(*Terms expiring 1944*)

D. C. BARNES.....Engineers Public Service Company, New York, N. Y.
SAMUEL FERGUSON.....The Hartford Electric Light Company, Hartford, Conn.
P. H. GADSDEN.....The United Gas Improvement Company, Philadelphia, Pa.
C. E. GROESBECK.....Electric Bond and Share Company, New York, N. Y.
W. J. HAGENAH.....Public Utility Engineering & Service Corp., Chicago, Ill.
EDWARD REYNOLDS.....Columbia Gas & Electric Corporation, New York, N. Y.
A. H. SCHOELLKOPF.....Niagara Hudson Power Corporation, New York, N. Y.
E. W. WAKELEE.....Public Service Corporation of New Jersey, Newark, N. J.